

COMPUTERWORLD

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Contu Approves Data Base Copyrights

By Edith Holmes
CW Staff

WASHINGTON, D.C. — The National Commission on New Technological Uses of Copyrighted Works (Contu) has decided to recommend to the President and Congress that computer data bases be protected by the new copyright law.

But commission members voted against providing software that same protection. At a recent meeting of the full commission in New York, Contu's members could not agree with the conclusion of its Subcommittee on Software that "the copyright law, applying as it does to all forms of expression, should be broad enough to shelter the works of Nobel Laureates and computer programmers

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Overall DP Spending in '78 To Top Last Year by 13.1%

By Jeffry Beeler
CW Staff

CAMBRIDGE, Mass. — Overall DP spending in the U.S. will rise 13.1% during 1978, International Data Corp. (IDC) predicted in the user spending section of its annual computer industry market forecast.

Among large systems users, DP expenditures this year will grow 10.6%, spokesmen for the market research firm said at a management seminar here last week. That figure agrees exactly with the increase *Computerworld* predicted recently in an independent forecast of large systems spending [CW, Jan. 9].

Among small and medium systems users,

meanwhile, DP budgets will rise 14.5% and 13.2%, respectively, the market survey added.

Much of the anticipated growth in DP spending will result from increased hardware purchases, IDC said. Driven by the demand for improved throughput and computing productivity, about 62% of domestic users will acquire some kind of hardware during the coming months.

Heavy Demand Areas

Demand will prove particularly heavy for CPUs, terminals, and disk drive systems. About 36% of U.S. users, for example, plan to add or upgrade a major CPU this year, compared with 40% in 1977, IDC said.

As a result, spending for large mainframes will increase 10.8% during 1978, the study forecast. At the same time, expenditures for medium and small CPUs will rise 14.5% and 15.2%, respectively.

Forty percent of domestic users, meanwhile, expect to acquire disk drive systems; 42%, terminals; and 32%, other major equipment including minis, the survey found.

Because of these planned purchases, hardware spending among users will grow 15% this year to exceed \$15.1 billion, IDC added. During the previous

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For Distributed Processing DEC Links Incompatible Systems

By Ronald A. Frank
CW Staff

MAYNARD, Mass. — Digital Equipment Corp. has expanded its Decnet communications software with interface programs it said allow previously incompatible systems to interact in distributed networks.

The programs permit users to configure multipurpose distributed networks, interfacing previously incompatible applications to allow remote intersystem file access and similar functions, the company said.

Software interfaces were introduced for DEC processors operating under the RT-11, RSTS/E and VMS operating systems. Decnet-RT covers PDP-11 machines running under the RT-11 real-time operating system; Decnet-E covers PDP-11/34 to PDP-11/70 processors operating under RSTS/E; and Decnet-VAX works with the recently introduced VAX-11 running under the VMS operating sys-

tem.

Enhanced Decnet software was also introduced for the RSX-11D, RSX-11M and core-only RSX-11S and for the multifunction IAS operating system.

Although the amount of additional memory required for the Decnet software will depend on individual systems, "major storage upgrades are

not required," a spokesman noted.

The firm made changes to the Network Service Protocol (NSP), Data Access Protocol (DAP) and Digital Data Communications Message Protocols (DDCMP) within DEC's Digital Network Architecture. DAP now has improved support for various file systems and NSP functions now handle

(Continued on Page 6)

Bill Would Fund Electronic Mail

By Edith Holmes

CW Washington Bureau

WASHINGTON, D.C. — Congress is considering a bill that would require the U.S. Postal Service to spend by 1980 at least 2% of its budget from the preceding year on research and development efforts that include electronic mail.

But the Carter Administration —

chiefly through the Justice Department — and the few computer and communications companies and associations aware of H.R. 7700 fear the proposal is another "Bell Bill" that would turn over electronic mail and electronic funds transfer to a regulated monopoly rather than allow this new technology to be offered competitively.

The Postal Service Act of 1977 calls for the post office to spend a minimum of \$300 million by 1980 and at least \$500 million by 1985 for R&D. The Postal Service budget for R&D during fiscal year 1978 is \$32 million, less than .2% of its expenditures, according to the House committee report on the bill.

While there are some stirrings of concern among staff members of the House Subcommittee on Communications, the vast majority of the House and Senate support the bill and expectations are that it could pass the Congress sometime this year.

Change of Heart

The Postal Service itself — which was reluctant to acknowledge the potential of electronic mail when the Commission on Postal Service warned it last April to consider the technology or die — now indicates it has plans to

experiment with it this year.

Former Postmaster General Benjamin F. Bailar said in a recent interview with the *New York Times* that a prototype electronic mail system will be established and offered in conjunction with a partner whose identity is as yet uncertain. The message service may be adapted to money orders, Bailar added. RCA Corp. is conducting a feasibility study for the post office on such a system.

A Jan. 9 article in *Barron's* quoted IBM Chairman Frank Cary as saying that Satellite Business Systems might

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Change in SSA Reporting Could Hurt Fraud Detection

By Edith Holmes

CW Washington Bureau

WASHINGTON, D.C. — The Social Security Administration's (SSA) move from quarterly to annual wage reporting could make a lot more difficult federal efforts to catch cheats by computerized matching of welfare rolls and the like with employment records.

SSA wage information used by the Department of Health, Education and Welfare (HEW) — and now by state and local welfare agencies — to detect fraud will be updated only once a year rather than four times, making the data increasingly stale as the calendar year wears on [CW, Jan. 23].

"Data will be less current for the

federal government and the 13 states which rely on SSA for wage information," an HEW spokesman conceded. But, he added, 37 states will continue to have comparable information available to them on a fresher basis because they still require employers to report wage data on a quarterly basis.

"Certainly less current wage information will make matching projects more difficult because the employment information will require more checking," the spokesman said.

States and the federal government might have to delve into unemployment compensation records, for example. If private companies permit

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CW in D.C.

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By at Least Five Years

Frank Says SNA Behind the Times

By Ronald A. Frank
CW Staff

TUCSON, Ariz. — There is a huge gap today between what teleprocessing users need and what IBM's Systems Network Architecture (SNA) can do, according to Howard Frank, president of Network Analysis Corp.

IBM continues to be five years behind in providing telecommunications capabilities, Frank contended, predicting it will be the 1980s before SNA will provide the features today's users need.

Frank's opinions were presented at the recent National Conference on Information Systems Development at a session dealing with management perspectives on SNA. Presenting another viewpoint was N. D'Arcy Roche, manager of product marketing for communications systems at IBM, who said the architecture has gone a long way to improve the capabilities of communications users.

SNA has given users access to multiple applications from a single terminal; it has allowed CRTs, teleprinters and other devices to operate on the same line facilities; it has upgraded user networks from half-duplex to full-duplex transmission; and it has provided better CPU utilization of communications functions, Roche told at-

tendees.

Despite the improvements that have been made, IBM "still has a long way to go" with SNA, he said. The goal is to develop the architecture so it will support any user with any application running on any CPU from any terminal device, he added.

Frank called SNA a "reasonable paper statement of telecommunications policy that works in most environments. But," he said, we "must separate the architecture from the implementations."

The key question for the user is whether IBM could have done other things, Frank said, asserting the focus on central computing within IBM dictated an architecture that was different from what was being developed outside of IBM.

Mini Level Implementation

Both the Telenet and Arpa networks are implemented on a minicomputer level so a host has no influence on network operations. In this regard, SNA architecture could be imposed onto Arpa architecture, Frank explained.

But SNA includes a system services control point that will continue to reside in the host CPU for the foreseeable future. This continues the concepts of centralized DP control, he said.

"If you believe in the concept of voice and data coming together, then having a host run the network cannot succeed," he believes.

Addressing the charge that SNA is expensive to implement, Roche said that "once you put the access method and [Network Control Program] in the host, you have paid your ticket for SNA." Users should not convert to SNA with an "entire environment," but look instead at its implications on an individual application basis, he advised.

Representing the user viewpoint on the panel was Richard Cambron, systems manager at Commercial Union Assurance Co. in Boston. Cambron described a "pilot" IBM 3790 network now operating at his company to process Massachusetts automobile insurance policies.

The company needed intelligence at remote offices but, at the same time, had to process policies as if they were operating on-line. The 3790/SNA network was selected as the solution, Cambron said.

Complete records of any customer can be called up on 3270-type CRT screens at any Commercial Union office connected to the system. Even though the system appears to be operating on-line, local transactions are stored at remote offices in a daily file, which is transmitted several times each day to the corporate DP center for file updating.

Cambron said the key point for SNA users to remember is that applications must be "properly insulated" so that a failure in one part of the system will not bring down the entire network.

Corrections

In the confusion caused by the recent blizzard here, *Computerworld* inadvertently omitted a key piece of information from the story "Bank Consortium to Ensure Emergency DP" [CW, Feb. 13]. The mysterious "Jacobson" in the story is Robert Jacobson, who is serving as director of the consortium project. Readers interested in more information about the project can contact Jacobson at (212) 398-3698.

In "Driver Finds 'NONE' Worse Than 'Nothing'" [CW, Feb. 6], the Department of Motor Vehicles should have been identified as being that of the City of Reno, not that of the State of Nevada.

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1978? It's liable to be the *migratingest* year since the old Oregon Trail was closed down for lack of interest.

A lot of solid data-processing citizens — you may be one of them — are going to auction off the old system, pull up stakes and head out for the promised lands of MVS or VS1.

And IBM will be only too happy to help you get there! No doubt you've grown accustomed, these past few years, to the strident yells of their wagonmasters — and mistresses — "Head 'em up! Move 'em out!"

Well, great, we say. For the adventurous data processor with an itch for multi-programming, the streets of MVS and VS1 are paved with gold. Neither system is nearly as wild and woolly as it once was. Why, nowadays, even a sweet young programmer can walk down the streets without any problems at all!

All the same, there are some dangers to keep an eye peeled for in the new land. No. 1 on the list is software that doesn't perform as well out there on the Frontier as it did Back Home.

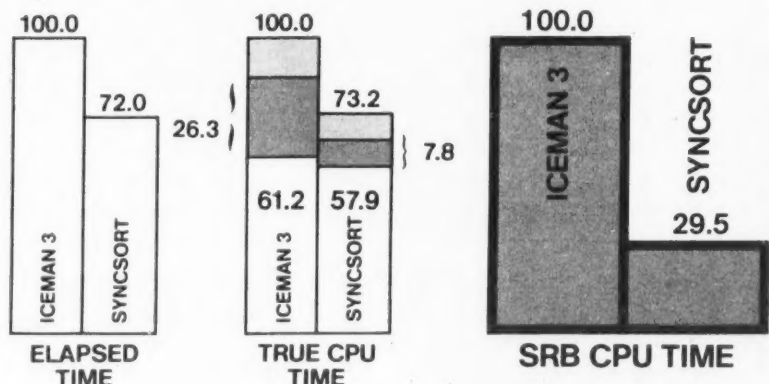
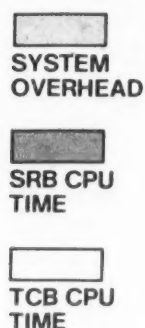
In some sort programs, for example, there's a sneaky little component called "locked-up True CPU Time" — and it can be as paralyzing to a multi-programming system as a rattlesnake bite to a rabbit.

Like the mighty Sioux Nations, True CPU Time in MVS is divided into Systems Overhead and two other territories:

- TCB Time (Task Control Blocks), which is *interruptible*. If the CPU wants to switch signals, the message gets through and the cavalry arrives on time.
- SRB Time (Service Request Blocks), which is *non-interruptible*. The message doesn't get through and another one of those deplorable DP massacres occurs.

Take a squint at the charts below, particularly the two on the right. They compare SyncSort's overall performance with that of IBM's 5740-SM1, Release 3. SyncSort has 70% less of that venomous locked-up time:

COMPONENTS OF
TRUE CPU TIME



OVERSEAS REPRESENTATIVES —

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Geneva: CAP/GEMINI Switzerland
Hague: CAP-GEMINI/PANDATA
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London: GEMINI Ltd.
Melbourne: Shell Oil Co. of Australia
Milan: SYNTTAX
Paris: CAP/SOGETI PRODUCTS
Stockholm: BRA
Tel Aviv: ADVANCED TECHNOLOGY, Ltd.
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But don't take our word for it! Ask your friendly IBM rep. Chances are, he or she will look embarrassed and try to divert your attention to the shiny hardware goods laid out on the blanket.

If you keep probing, though, Old Straight Arrow will probably whisper, "If I was you pardner, I think I'd go with SyncSort."

And you wouldn't expect Old Straight Arrow to speak with forked tongue, would you?

By Federal Court in Texas

Child Abuse Data Base Found Unconstitutional

HOUSTON — A federal court here has ruled that the manner in which the State of Texas implemented and operated a data base of reported cases of child abuse or neglect is unconstitutional.

In *Sims vs. the State Department of Public Welfare*, a three-judge panel found that the Texas Child Abuse Neglect Report Inquiry System

(Canris) was an "unconstitutional infringement on the right to privacy and guarantees of due process."

Canris is a computerized system used to store confidential information collected by the state during a child abuse or neglect investigation. Each record is based on the conclusions of the social worker who investigated the case, not of a jury or judge.

The opinion, written by Judge John V. Singleton Jr., did not dispute the state's legal right to maintain investigative files and a clearinghouse of child abuse information. However, it found that to the extent that Canris purports to be a clearinghouse of child abuse information that has not actually been determined by a court of law, it is unconstitutional and in-

fringes on the right of the parents whose reputations could be ruined by the system.

The January issue of *Computer Law and Tax Report* (CLTR) published in Boston, Mass., by Warren, Gorham & Lamont, Inc., said this about the case:

"One of the major complaints against computerized record systems during the '60s and '70s was the ease with which abbreviated evaluations of individuals in situations could be entered into the file without review or an opportunity to contest the characterizations, and then come back to haunt the individual so labeled. People fear Garbage In, Gospel Out," CLTR said.

"The *Sims* case shows that Canris was exactly this kind of system. Organizations that establish a computerized data bank with personal information must make a special effort to insure that the system treats human beings fairly," the monthly newsletter concluded.

Bill Allots R&D Funds to Electronic Mail

(Continued from Page 1)

lease service to the Postal Service for electronic mail.

The Postmaster General resigned his office last week to become executive vice-president of U.S. Gypsum. Until his interview with the *Times*, Bailar had repeatedly stated he believed the post office should learn to deliver packages on time and without mangling them before venturing into electronic mail.

In addition to the Postal Commission, H.R. 7700 sponsors James M. Hanley (D-N.Y.) and Charles H. Wilson (D-Calif.), who head postal subcommittees in the House, have encouraged the post office to explore electronic mail.

Despite its opposition to the means by which H.R. 7700 would establish the subsidy due the post office from the federal government, the Carter Administration, too, agreed the impact of electronic communications technology on mail volume and services must be assessed and responded to by the Postal Service. W. Bowman Cutter, executive associate director for budget in the Office of Management and Budget, said during hearings on H.R. 7700.

Very little of the testimony before house subcommittees on H.R. 7700 dealt with electronic mail R&D. The president of the National Association of Letter Carriers, J. Joseph Vacca, expressed the union's support of electronic mail and electronic fund transfers (EFT) for the post office, contending that without these new technologies the Postal Service won't survive.

While it did not oppose an electronic mail operation, the American Retail

Federation, Inc. did denounce Postal Service development of EFT systems.

The federation opposes "the use of public financing to develop an electronic communications system which would compete with private [EFT] systems, especially where the Postal Service by deficit financing could secure a virtual monopoly over such communications, even outside the private express monopoly."

"There is broad support for the notion that the postal service must understand the roles it can play in electronic mail, a congressional staff member said last week. Down the road are significant policy questions regarding the future of electronic mail and communications in the U.S. in general, and 'these won't be solved or even addressed by H.R. 7700,' he added.

The Real Issue

"There is no question the Postal Service will get into electronic mail," a Justice Department spokesman asserted. "But," he added, "electronic mail isn't the real issue."

The issue is the Private Express Statutes that assure the Postal Service a monopoly over "letter" carriage. These statutes permit the Postal Service to subsidize unprofitable rural and second-class mail services with such competitive offerings as first-class mail — and, potentially, electronic mail — and this is the real threat to competition in electronic communications technologies, the spokesman contended.

Under the Private Express Statutes, a "letter" is any message written on or in an object and intended for delivery to a

specific address, the Justice Department spokesman said. Only the Postal Service is permitted to handle letters.

Revisions to the criminal code now before the Senate would "drastically increase the penalties" for violators of these laws, he noted. Fines would be in the \$5,000 to \$100,000 range.

Customers at Risk

The Postal Service has a tradition of enforcing the Private Express Statutes through customers of alternative delivery services rather than through the deliverers themselves, according to the Justice Department.

A DP shop can send and receive source documents, for example, by some means other than the post office — as long as postage is paid for the package. If a postal inspector discovers postage hasn't been paid, the DP operation will be fined, he suggested.

While the Postal Service has stated it has no intention of expanding the Private Express Statutes to cover electronic mail, it has also engaged in "knock-down battles" with such prominent U.S. firms as AT&T over the shipment of toll tickets by Greyhound bus. The Justice Department doesn't believe the Postal Service on this score, the spokesman said.

CCIA Opposed

Like the Justice Department, A.G.W. (Jack) Biddle of the Computer & Communications Industry Association (CCIA) opposes H.R. 7700 but goes further, believing the fight against it should begin now rather than "down the road."

"There is no way the post office can spend \$300 million internally for R&D by 1980," Biddle contended. "This effort must be contracted out."

The Postal Service is not covered under any of the federal government's procurement rules that require competitive bidding for contract awards, however, he said. Biddle believes there is a good chance the Postal Service contract for the development of electronic mail could go to one contractor.

Contu Says Yes To Copyrights

(Continued from Page 1)

without causing any confusion about which is which."

The Subcommittee on Software will meet soon to determine what amendments should be made to its report to ensure the agreement of all Contu's commissioners. The full commission won't meet again to decide this question until late April.

The Contu Subcommittee on Data Bases never had such problems. In its report to the commission, it noted the agreement among its members that Congress intended the new copyright law to protect computer data bases as it would traditional hard-copy compilations [CW, July 4].

The Subcommittee on Software acknowledged early in its report that "certain commissioners are skeptical about the need for any form of protection for computer programs as well as the copyrightability of such works."

Eight months later, "There is still a good deal of controversy regarding the report of the subcommittee," according to Michael S. Keplinger, senior attorney and assistant director.

'Reserved Territory'

Among those leading the fight against providing copyright protection for computer programs has been well-known author John Hersey. The novelist advocates the creation of a new form of protection for computer programs and similar technologies — "a reserved territory," as Hersey describes it — something between a copyright and a patent that has aspects of both but is neither.

Hersey contends that computer programs are more mechanical devices than they are works of authorship. "The computer program is something strikingly new in our culture," he added in his original dissent from the Software Subcommittee report.

"There has been feeling all along that what Mr. Hersey has been saying has merit," Keplinger stated. "The problem facing the commissioners is how to deal with it."

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IBM Europe Urges Limits on Privacy Rules

Special to CW

BRUSSELS, Belgium — IBM Europe is promoting a "go slow" position on international privacy regulations. In a recent statement to the European Parliamentary Committee on Data Processing and the Rights of Individuals, IBM advanced a clear-cut position urging:

- That national privacy laws be limited to physical persons and not concern legal or corporate entities.

- Self-regulation under a framework of legal regulation and responsibility rather than the general licensing schemes adopted by Sweden and France.

- Avoidance of detailed security requirements that may be ill-suited to actual needs or inhibit development of new techniques providing improved safeguards.

- Caution on blanket regulation for either public or private registers of personal data, proposing instead a functional "sensitivity according to user" context.

- No official action by the European Community on transborder data flows until the Council of Europe and the Organization for Economic Cooperation and Development can act, to avoid risks of incompatibility and resulting uncertainty of compliance costs.

The IBM statement was in reply to a questionnaire prepared by the committee and presented at a public hearing on Feb. 6. Claiming no "particular expertise in such areas as human rights or international law," IBM concentrated on points "which are of interest to a manufacturer and a vendor of data processing equipment and services and to a business organization operating at an international level."

Supporting the concern of many in the U.S. DP community about the dangers of ignoring manual files, IBM Europe sees little justification for privacy legislation concentrating on DP alone. The firm contended that DP does not cause abuse of personal facts and suggested instead that "the source of actual harm should be the object of regulation."

Limit to Physical Persons

The IBM concern that protected data be limited to physical persons was recently demonstrated during the French parliamentary consideration of "data processing and freedom" legislation. The lobbying by leaders of IBM France is considered by some to be responsible for the deletion of legal persons from the French law.

IBM strongly favors applying privacy rights exclusively to individuals, noting the alternative definition "has wide implications for industry and commerce. Under the latter definition all files of data concerning suppliers, customers, prospective customers and competitors, including for example market research files, would fall within the ambit of the law."

"This would even be the case when all the data in question refers solely to business corporations and individuals are not affected by the data. All business entities would have to allow customers, prospective customers, suppliers and competitors rights of access to information held by the business entity," IBM said, adding this raises fundamental problems for competitive

business enterprises which have not so far been adequately addressed by either the legislators or the business community."

The statement also took note of the fact that draft privacy legislation pending in Austria, Belgium, Denmark, Norway and Luxembourg pertains to data concerning legal persons.

As to the issues of distorted competition being raised by the European Community in its support of a common policy on transborder data in the nine countries, IBM indicated it was not aware of any "concrete evidence" that DP laws have had a significant effect in distorting competition.

However, "the cost of meeting different data protection legislation and denial of data about a market to sup-

pliers" when legal persons are included under privacy laws could be harmful to multinationals.

Referring to the categorical principles of fair personal information practices that are often taken for granted in European legislation, IBM noted exceptions to several of these broad generalities:

- "There must be no secret data banks." This principle cannot apply in the sphere of state security.

- "Right of consent to collect personal data should be universal." This principle cannot apply without qualification in the sphere of criminal investigation. Some qualification is also necessary in connection with performance assessment in education and employment, IBM pointed out.

- "The right of access to stored personal data" and "right to correct stored personal data" cannot be absolutes. These principles cannot apply without qualifications to prevent the abusive exercise of these rights, IBM said.

- "The right to block usage of allegedly incorrect stored personal data" has limits. This principle should be subject to an onus of proof. Otherwise the principle is potentially subject to abuse, it noted.

The hearing before the parliamentary committee is intended to bring together government experts and legal, professional and commercial organization spokesmen who wish to submit their views on future European Community policy on data protection.

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Antitrust Review Commission in State of Limbo

By Edith Holmes

CW Washington Bureau

WASHINGTON, D.C. — President Carter's three-month-old National Commission for the Review of Antitrust Laws and Procedures is in a state of limbo.

Signed into existence by Executive Order 12022 on Dec. 1 [CW, Dec. 12], the commission cannot begin its search for procedural and legal means to expedite large antitrust cases the size of U.S. vs. IBM and U.S. vs. AT&T until its members are named.

The President has made no formal appointments to the commission. To date, however, three members of the House of Representatives — Barbara Jordan (D-Texas), Robert McClory, (R-Ill.) and Peter Rodino Jr. (D-N.J.) — are believed to be slated for service on the commission, a Justice Department spokesman said.

No word has reached the Justice Department employees who are busy arranging administrative and clerical support for the antitrust commission on who the appointees from the Senate and the private sector will be or which federal district court judge will be asked by Carter to serve.

The commission, which will have a six-month life after the last of its members is appointed, will be aided by staff from the Department of Justice, the spokesman stated.

Among the antitrust commission's duties will be the creation of a roster of district court judges who are knowledgeable in antitrust law and the problems of large case and to whom such cases may be assigned.

The President's order also asks for recommendations that would narrow

as quickly and precisely as possible the scope of contested issues of fact and law in big cases and revise discovery practices to limit expensive and time-consuming inquiry into areas not important to disputed issues.

In addition, the commission will examine the option of giving judges faced with large antitrust cases the power to penalize parties who delay the formulation of issues or fail to cooperate with the court and their adversaries.

Simplified standards for establishing attempted monopolization of an industry under Section 2 of the Sherman Antitrust Act and structural relief and "nonjudicial alternatives for resolution of complex antitrust issues" will also be considered.

When the commission's members will be appointed and able to look into these areas is "anybody's guess," the Justice Department spokesman said. "We assumed things would move much more rapidly than they have."

DP Spending in '78 to Beat '77 by 13.1%

(Continued from Page 1)

year, the total user budget for hardware approached \$13.1 billion for a 13% annual growth.

Altogether, hardware expenditures will account for about 36% of the \$41.7 billion that IDC estimated users will spend this year for DP. Personnel, the largest single expense item, will account for another 45% of the total budget; communications, for 3%; software and services, for 6%; and supplies and overhead, for 5% each.

In the personnel area, the report estimated user spending this year will

near \$18.4 billion for a 13% increase, compared with nearly \$16.3 billion and a 10% growth last year. DP salaries will increase an average of 7.2% in 1978, and overall manpower will grow 2.3%.

By contrast, salaries and staffs increased 6.2% and 2.8%, respectively, during 1977, IDC noted.

Shift to Outside Software

Partly to ease the burden of rising personnel costs, users will increasingly shift their emphasis from in-house programming to outside software and services. By year's end, total spending in this area will top \$2.6 billion, a 27% jump over the previous year's expenditures of about \$2.1 billion, the study predicted.

As users rely increasingly on outside programming, spending for customized and off-the-shelf software will show especially marked growth.

Last year, budgets for these products grew 10.9%; this year, the increase will total 14%, the market report projected. User budgets for DP services, meanwhile, will decline 2.4% this year, compared with a 4.2% rise in 1977.

In the data communications sector of the DP budget, spending will also increase sharply, from about \$1 billion in 1977 to more than \$1.3 billion this year. IDC credited this projected 28% growth primarily to an almost universal user interest in applying data communications to new and existing applications.

On the other hand, Systems Network Architecture (SNA) has encountered unexpectedly stiff resistance from IBM users, and a similar fate has befallen other vendors' versions of SNA. Although 42% of domestic users plan to use SNA eventually, only 10% have adopted the technology thus far and 37% have rejected it altogether, the market forecast reported.

In other findings, IDC predicted 42% of U.S. users will add a major new application to their systems this year, and another 28% will upgrade existing applications. Among large and medium systems users, nearly all these new or improved jobs will be communications oriented, the survey said.

IDC also forecast that 20% of small systems users will add their first online application in 1978, while 30% of all domestic users plan no new applications this year.

SSA Changes Seen Hindrance

(Continued from Page 1)

federal, state and local government officials to check their employment records, these agencies won't have to worry about the validity of SSA data, a Capitol Hill source said.

Government access to private records "seems to be the trend in some places," he added.

Government access to private records is also likely to be the subject of hearings and of new privacy laws this year, another Capitol Hill observer pointed out. Whether annual wage reporting to the SSA will cause the agency to be in violation of the Privacy Act of 1974, which requires that data in federal information systems be accurate and timely, is still another unanswered question, he said.

DEC Software Backs Networks

(Continued from Page 1)

"diverse operating system" characteristics by doing such things as arbitrating different buffering features to prevent network overloads, the spokesman said.

Not covered in the announcement were Decnet upgrades for the PDP-8, Decsystem-10 and Decsystem-20.

Configuring Eased

The latest Decnet programs are said to simplify network configuration and generation. Dynamic reconfiguration is available in case of malfunction and lines can be switched without interruption of service, the company said.

The programs share full point-to-point interconnect capability for task-to-task communications by which programs running on separate network nodes can exchange data. The programs also allow the transfer of files from one node to another on user command, according to the spokesman.

Remote resource access allows users at one node to utilize peripherals at another node. Remote sequential I/O of files is also supported.

The software supports any Ascii sequential files, the firm said.

The software will be distributed for a license fee covering installation and support up to the network node level "in a stand-alone mode." The fee for each program includes one year of systems support.

License fees are \$1,500 for Decnet-RT and Decnet-S systems; \$2,700 for Decnet-M, Decnet-E and Decnet-VAX systems; and \$3,500 for Decnet-D and Decnet-IAS systems. Deliveries are scheduled to begin next month for all software except Decnet-VAX, which is slated for first installation in January 1979.



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WANG

Tracking Study Showed How Michigan Keeping High-Risk Felons in Prison

By Jeffrey Beeler
CW Staff

LANSING, Mich. — A computer analysis of prison inmate case histories is helping penal authorities here keep dangerous criminals off the streets and, at the same time, relieve serious overcrowding in the state's prisons.

In a study of 2,000 convicts paroled in 1971, Michigan Corrections Department head Perry Johnson and his staff found prison inmates most likely to commit violent crimes when released from jail have the following background traits in common:

- A series of arrests beginning before age 15.
- A history of major misconduct while in prison.
- At least one conviction for a serious assault like rape or murder.

When an inmate of one of the state's prisons applies for parole, penal authorities review his arrest record and case history to estimate how much of a risk his release would pose to public safety. If the inmates' background indicates a high potential for violence, officials usually deny his request for parole and thus ensure that he serves a full prison sentence, according to William Kime, deputy director in charge of the Corrections Department's program bureau.

If the prisoner does not have a long history of assaults, however, authorities classify him as a low-risk individual and often approve his parole application quickly. This preferential system of granting paroles helps the state minimize the number of inmates in its jails by speeding the turnover of low-risk convicts, who constitute by far the largest percentage of the total prison population, Kime said.

"The whole purpose of the computer analysis is to find out which prisoners are violent and which aren't so we can hold the dangerous ones longer and release the less dangerous ones sooner," he explained.

Only Three Variables

Completed last January under the supervision of Project Director Doug Kinsey, the analysis drew most of its raw data from court and prison records like presentence report, which under law must be prepared for every convicted felon in state institutions. A typical presentence report summarizes a subject's arrest record and provides extensive information including a description of his early home life, size of his home town, employment history, educational background and marital history.

To a lesser extent, the study also depended on raw data from police files. Corrections Department officials par-

ticularly noted details like whether a parolee's activities had resulted in bodily harm to his victims and whether his offenses were committed with the help of accomplices.

When they had assembled all their data, Kinsey and his staff isolated — with the aid of psychiatrists, penologists, criminal literature and other information sources — some 350 variables they hoped might foretell an inmate's future capacity for violence.

After coding and cross-tabulating their data, they narrowed the field of possible indicators to just three variables — age of first arrest, behavior while in prison and nature of current conviction.

Using these variables, they then predicted each prisoner's chances of committing a violent crime while on parole and classified each subject into one of five risk groups — very high, high, medium, low and very low.

Almost Perfect Agreement

At this point, the Corrections Department officials arbitrarily split their study sample into two equal groups. For the first 1,000 subjects, they attempted to predict the frequency of violent crimes in each risk group and concluded that 40% of the very high risk inmates would commit serious assaults during parole, compared with an estimated 10% for the sample as a

whole and just .5% for the very low risk group.

For the other 1,000 inmates, they made no predictions. Instead, they observed the subjects after their release from prison and noted the frequency of violent crime in each of the five risk groups.

They then compared the theoretical predictions from the first half of the study sample with the experimental observations from the second half and found the two sets of data agreed almost perfectly, Kime said.

A recent follow-up study yielded similar results, he added. In a sample of 145 convicted felons, the Correc-

(Continued on Page 8)

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NBS Eyes Standards Efforts, Asks Funds Boost

By Edith Holmes

CW Washington Bureau

WASHINGTON, D.C. — The National Bureau of Standards (NBS) has trebled its fiscal year 1979 budget request for its Institute of Computer Sciences and Technology in hopes of significantly improving the development of Federal Information Processing Standards, according to the institute's acting director, Zane Thornton.

Appearing before the Senate Science, Technology and Space Subcommittee here recently, Thornton said NBS will ask Congress to boost the institute's 1978 appropriations of \$4.3 million to \$13.4 million in 1979. Seventy-five percent of the funds the institute

hopes to obtain for the coming year will be used to develop standards on software-related problems, he added.

The institute "will continue to exist as an entity in NBS" when the bureau's reorganization plan, already approved by the President's Reorganization Task Force, the Office of Management and Budget and the Secretary of Commerce, goes into effect on April 9, Dr. Ernest Ambler, NBS director, told the subcommittee.

Under the reorganization plan, the institute will share the NBS limelight with two new laboratories — the National Measurement Laboratory and the National Engineering Laboratory. The Computer Sciences and Technology organization has undergone

the least amount of change, according to the reorganization documents NBS provided the senators.

The institute will retain its Systems and Software Division, Computer Systems Engineering Division and Information Technology Division. Its "mission" will center on the standards-making and technical advisory functions given it under Public Law 89-306, the Brooks Act of 1965, Ambler said.

The reorganization documents further suggest the institute will continue to develop computer security standards in accordance with the Privacy Act of 1974.

to "a lack of resources in the institute and in NBS to carry the program out."

"If funded, the five-year plan should lead to the more timely development of standards by strengthening management control of the development process and reducing reliance on purely volunteer, part-time labor to staff standards development task forces," Thornton stated.

"Moreover," he added, "the plan and adequate funding will give the government the latitude to reduce dependence on voluntary commercial standardization activities whenever it becomes clear that those activities are not moving at a pace or in a direction that will

Ambler Gets the Job

WASHINGTON, D.C. — The U.S. Commerce Department's National Bureau of Standards (NBS) has its first "official" director in two and a half years. Dr. Ernest Ambler, who has been "acting" in that capacity, got the job.

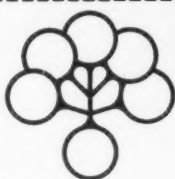
Ambler joined NBS as a research physicist in 1953 and for the next two decades successively headed the agency's Cryogenics Physics Section, Inorganic Materials Division

and Institute for Basic Standards. He became deputy director in 1973 and acting director two years later, NBS said.

The native Englishman and naturalized U.S. citizen has authored 51 publications, holds a patent for low temperature technology, is a fellow of the American Physical Society and a member of the American National Standards Institute Board of Directors.

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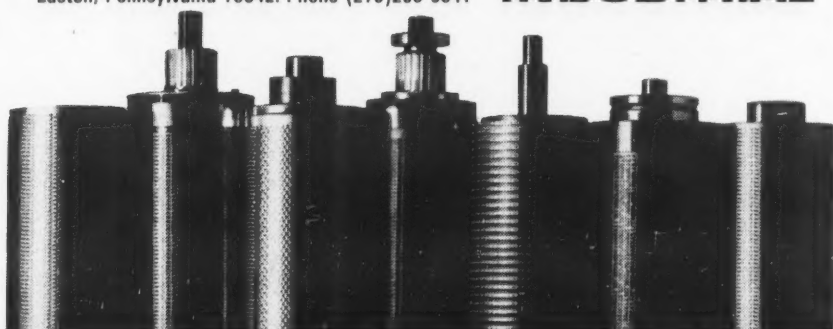
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NBS' request for more funds for computer and communications standards work stems from "a major effort in 1976 to strengthen the standards development program and achieve a more meaningful implementation of the Brooks Act," Thornton said. The result of this effort was a five-year plan centered on the standards development function, he explained.

"This plan, covering the fiscal years 1979-83, was the basis for the president's significantly expanded budget request for the [federal] Standards Program for fiscal year 1979," Thornton noted.

Reaction to GAO

Observers at the hearing also suggested a recent General Accounting Office (GAO) draft report on the standards work at the institute [CW, Jan. 30] might have prompted efforts to beef up the program.

The GAO draft accused the institute of "bureaucratic ineffectiveness" and an overreliance on the private sector with its own set of self-interests in the development of DP standards.

Asked about the GAO draft report, Thornton said it was "hard to say the GAO's criticisms aren't justified." He attributed the problems the institute faces in the promulgation of standards

satisfy essential federal goals and requirements."

The institute will continue to participate in voluntary commercial standards activities, Thornton said.

Software is the focus on the five-year plan chiefly because of the growing ratio of software to hardware costs in federal DP expenditures, the institute's acting director explained.

To judge the importance of the development of high-level programming, language standards and their potential impact on software conversion costs, one need only consider that estimates now indicate more than 80% or about 8,500 general management computers in the federal inventory will be replaced by 1985, Thornton said.

The institute would like to eliminate software conversion as an obstacle to the competitive procurement of computer systems in addition to reducing the costs of converting software from one set of equipment to another.

If the institute gets the full \$13.4 million it has requested for standards development, federal users will see a push to expedite the development of 10 families of standards — including those involving software quality control, performance assurance and computer system functional specifications, Thornton stated.

Study Eases Parole Choices

(Continued from Page 7)

tions Department found 43% of the very high risk group committed assaults during parole compared with 15% for the high risk inmates, 5% for the medium risk prisoners and none for either of the two lowest risk groups.

"Our predictions turned out to be much better than we had hoped for, and we don't expect to achieve that kind of accuracy again," Kime said.

Using the same study sample of 2,000 inmates, Kinsey and his col-

leagues also attempted to predict the parolees' chances of committing property crimes. But the predictions from that study proved much less accurate.

Using manual DP techniques, Corrections Department officials made the first preliminary results from their analysis available in June 1976, more than a year after the study began. They later reanalyzed their findings with a 98K-byte Control Data Corp. 6500 at nearby Michigan State University and made the resulting refinements part of their final conclusions.

'All Our Nations Intertied'

New Body Urged for Regulation of Data Flow

By Owen K. Darrath

Special to CW

BRUSSELS — An international regulatory body is needed to deal with the serious economic and legal problems associated with transnational data flow, according to John M. Eger, former head of the White House Office of Telecommunications Policy.

Speaking in Brussels recently before the Conference on Transnational Data Regulation, Eger said no existing body is capable of dealing effectively with the problems posed by data crossing national borders. The body he proposed must prevent nations from becoming isolated from each other.

"All our nations are intertwined and we are no longer free to act for ourselves; we have, indeed, responsibilities in a shrinking world to each other and, in

such laws [CW, Feb. 13]. "It is incumbent upon us to somehow make governments throughout the world aware of the composite effect of such legislation," he said.

"Under a new forum," Eger believes, "we can begin to address the problems that need to be dealt with: trade, technology transfer, privacy, proprietary and human rights."

Eger pointed to several obstacles to the free flow of information: misinformation and lack of information about technology on the part of governments; the fear of dependency on foreign data banks and data processors; and fears of a loss of national sovereignty.

It is vitally important to overcome these obstacles, he said, but "somehow the message simply has not gotten through because the regulatory rhetoric continues to grow."

"The old rhetoric persists while new barriers arise ... in the months ahead, more regulation can be expected," he predicted. "It can also be expected that once such regulation is passed, there can be little abatement, retraction or skillful rewriting of those laws."

The body he is proposing, Eger said, must surmount conventional nation-state negotiations "and construct a new agenda to preserve and strengthen our democracies."

In addition, planning for such a

forum must not be unduly weighed or influenced by a unilateral decision of any agency of any state, such as the U.S. Federal Communications Commission.

According to Eger, three objectives demonstrate a need for action by the new group: a review of all countries' laws and regulations to eliminate inconsistencies between nations; the need to keep regulation to a minimum; and the rapid development and adoption of new technology.

In particular, he said that tariffs should not be prohibitive, and should be based on volume and not the cost of leased lines.

Digest Planned

WASHINGTON, D.C. — The Commerce Department's Office of Telecommunications (OT) expects to complete a digest of foreign national privacy laws by the end of this month.

The countries whose laws will be included in the OT summaries and translations are Sweden, West Germany, Norway, Belgium, Luxembourg and Spain.

the economic sense, all our economies are already interdependent," he noted. The complexities of international business place a high premium on speed and accuracy, he added.

As an example of that interdependence, Eger cited the economies of scale which can result in the airlines of several countries being tied to a central computer in yet another country. Since the cost of replacing existing data services provided from another country with a domestic industry can be prohibitive, imposing stiff tariffs for use of such services may simply isolate a user and force him to drop out of an international data network.

In the forum he proposed, Eger noted, the ultimate beneficiary — the corporate or individual user — must have a clear and meaningful voice. Because the benefits brought by technology have tremendous economic importance to individual countries, cutting off the flow of data from one country to another will cause industries of all affected nations to suffer.

At the present time, 19 European nations have data protection laws already in force or in the making, and other countries are presently considering

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In 158, 30 Series Market

Warning Issued on 'Shell Game'

By Brad Schultz
CW Staff

WINTER PARK, Fla. — Some computer vendors that deal in popular mainframe models have resorted to shell game tactics, effectively selling the same equipment more than once or selling equipment that does not exist, according to a recent *Computer Negotiations Report* (CNReport).

When user demand for a particular mainframe exceeds available supply, many users turn to the used market for needed equipment, the report noted, citing the current IBM

370/158 market as a case in point.

Despite the 1977 reduction in used 370/158 prices, user demand for these CPUs now exceeds supply and IBM is unable to provide them on delivery schedules acceptable to many users. Delivery dates for the 30 series are even further away, according to the January CNReport.

The heightened demand for 158s with the lengthened 30 series delivery times has inflated the prices for early 158 and 30 delivery positions despite IBM pledges to eliminate this "future market," the re-

port said, pointing out that a \$200,000 premium was recently paid for an early 3031 delivery spot.

Sizable premiums are now tossed at anyone even claiming to have a 370/158, tempting vendors to be "overly optimistic" about their ability to find a 158, the report continued.

Substitution Clauses

Although a wary user may compel a vendor to supply the serial number for a 158 under consideration and perhaps an invitation to visit its current installation, the vendor may insert — as inconspicuously as possible — right-of-substitution clauses in the agreement, enabling him to continue offering the 158 to the highest bidder while searching for a substitute machine to give the party at hand.

The agreement may not stipulate exact delivery dates; if it does, it may not specify penalties for vendor non-fulfillment.

A user may not realize "his" 158 has been given to another customer until it is too late to get a replacement from another source, the report added.

In addition, the user who desperately needs the equipment and feels irrevocably committed — having paid a substantial holding deposit months earlier — may be intimidated from challenging the vendor's nonfulfillment, the report asserted.

Safeguards Urged

As safeguards against being victimized by this ploy, users should identify equipment by serial number and current location and should compel the vendor firm to warrant that it presently owns or has all rights to the identified equipment, free of any liens unless clearly understood and accepted by the user, CNReport recommended.

In addition, the user should compel the vendor to guarantee that identified equipment is not and will not be under contract for sale, lease or supply to any other person or firm, the report suggested, and should ensure that all these conditions will not lapse prior to the user's acceptance of the merchandise.

Moreover, the vendor should agree that no equipment may be substituted for the identified equipment without the user's consent in writing, and that alternative inspection and acceptance standards should prevail in any such substitution.

Finally, the report recommended that "meaningful" delivery and performance dates be specified, as well as corresponding penalties for vendor nonfulfillment.

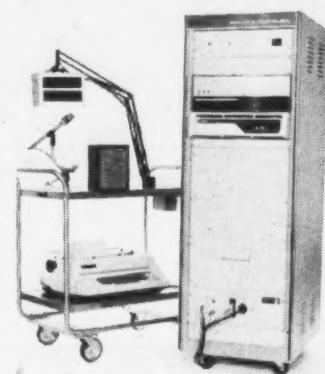
Voice-Command System For Immobile Patients

BELMONT, Mass. — Bed-ridden and paralyzed patients can now have voice control over their own bed motors, lights, telephones, televisions, typewriters and nurse calls with the help of a minicomputer-based hospital system developed by Dialog Systems, Inc.

The patient communicates with the Dialog 117 system by speaking into a microphone. The system has a vocabulary of 99 words and uses a CRT for verification of commands.

Based on a Digital Equipment Corp. PDP-11/04 minicomputer, the system converts sound waves into electrical signals which are amplified and converted into digital form the system's word processor can understand.

The Dialog 117 reportedly trains itself to the user's manner of speaking so it can respond to foreign accents and



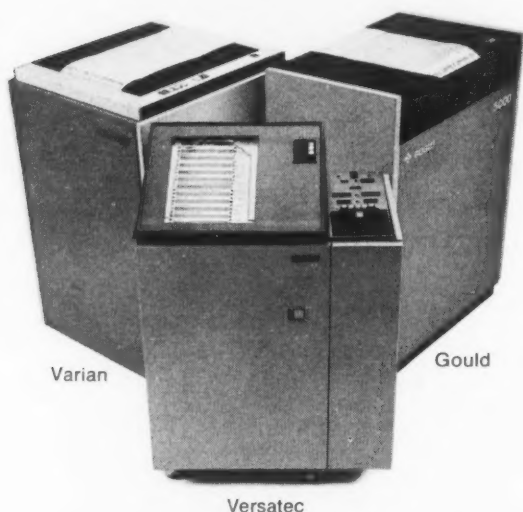
Dialog 117

dialects.

Patients can write letters by spelling out each word. The sounds picked up by the system are output on a printer.

With one channel servicing a single patient, the Dialog 117 costs \$57,600. For eight patients, it costs \$78,000. Dialog is at 32 Locust St., Belmont, Mass. 02178.

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And Vendor Drops Suit

Vote for Burroughs Ends Knoxville Imbroglia

By Jeffrey Beeler
CW Staff

KNOXVILLE, Tenn. — The long and sometimes bitter dispute over a proposed computer procurement ended here recently when the Knoxville city council voted 5-4 to approve a contract for a Burroughs Corp. B2810 system.

The vote took place in the early morning hours of Feb. 8, just six days after Burroughs dropped a lawsuit charging the city and 22 of its officials with violating an earlier agreement to acquire the system [CW, Jan. 30].

Mayor Randy Tyree cast the deciding ballot after a vote of the nine-member city council resulted in a 4-4 deadlock with one abstention. One day later, the city signed the contract for the Burroughs system, and Burroughs consummated the deal the following day.

Local officials expect to install the B2810 later this year

as a replacement for the community's existing General Electric (now Honeywell Information Systems, Inc.) 437, which City DP Manager James Ryan contends can no longer meet the area's expanded computing needs. Just hours before approving acquisition of the Burroughs system, the council had voted, again by a 5-4 margin, to scrap the city's four-year-old lease agreement with HIS, which Ryan said had neglected to supply 17 of 20 promised software packages.

For six months after becoming DP manager about a year ago, Ryan had tried to correct the software shortage through

negotiations with HIS. But when his efforts produced no results, he wrote 16 main-frame manufacturers early last September to request bids for an alternative system [CW, Dec. 19].

After evaluating 17 proposals from nine bidders, Ryan tentatively selected the B2810 in mid-October as the lowest "responsive" bid. He estimated the \$8,145/mo Burroughs system would cost the city about \$5,000/mo less to operate than the current HIS system.

Dramatic Reversal

The council's recent approval of the Burroughs pro-

posal marked a dramatic reversal in its attitude toward Ryan's hardware selection. Last Dec. 13, the council voted 6-2 to reject all previous bids and resume negotiations with HIS after the chairman of the city's Computer Advisory Committee convinced the group the B2810 would in fact cost almost \$88,000 more than the 437. Ryan later disputed Chairman Tom Sudman's claims and presented figures that purportedly proved his cost estimates contained more than \$630,000 in errors.

The abrupt turnabout in the

council's attitude stemmed partly from a recent shakeup in the group's membership. Since the anti-Burroughs vote in December, three outgoing council members who opposed acquisition of the B2810 vacated their seats for three new members, all of whom favored procurement of the new system.

Whatever the reason for the change, the council's recent approval of the Burroughs contract helped vindicate Ryan's professional judgment during the procurement controversy.

Professional Development Set as NCC Seminar Topic

MONTVALE, N.J. — The 1978 National Computer Conference (NCC) will feature a

Professional Development Series of 12 seminars covering latest developments, applications and trends in specific areas of interest to computing professionals, the American Federation of Information Processing Societies (Afips) announced here.

Four of the tutorial, one-day seminars are expected to examine user-oriented management issues, series director Gopal Kapur said, noting that in general the seminars will address topics in systems development, structured methodology, software engineering, data base management and cost-effective computer usage.

Among specific topics under consideration are cryptography, security and fraud, managerial development, managerial opportunities for women, structured testing of large systems, structured programming and microprocessor technology as exemplified by the Intel Corp. 8080, Afips said.

The NCC will take place June 5-8 in Anaheim, Calif.: its main part at the Anaheim Convention Center; the NCC Personal Computing Festival at the nearby Disneyland Hotel; and the seminar series at the Inn at the Park, which is adjacent to the convention center.

The separate registration fee for each professional development is \$45 and includes complete course material plus access to the four-day exhibit program and the Personal Computing Festival. Attendance will be limited to 125 people per seminar.

Additional information on the Professional Development Series plus further details on NCC are available from Afips at 210 Summit Ave., Montvale, N.J. 07645; or by calling (201) 391-9810.

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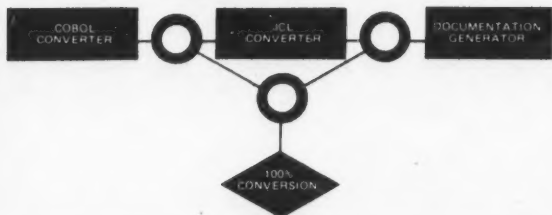
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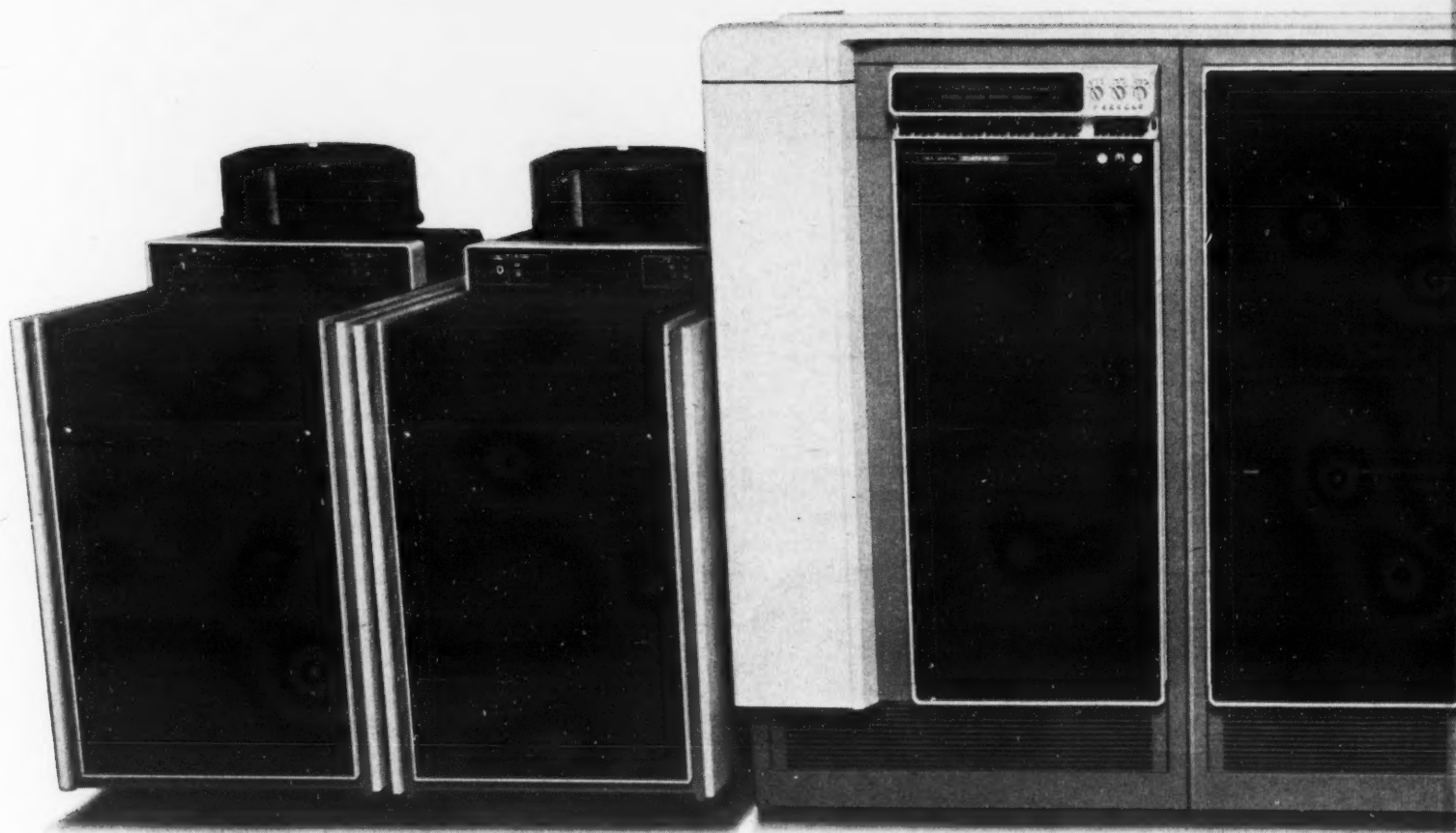
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Indian-Owned Firm Prospering in Arizona

By Brad Schultz
CW Staff

SACATON, Ariz. — Framed by desert that has changed little throughout the centuries of human existence, a contemporary American Indian reservation here is the site of the FM4 Gila River Corp., the only data processing firm known to be majority-owned by American Indians.

Located on the Pima-Maricopa Gila

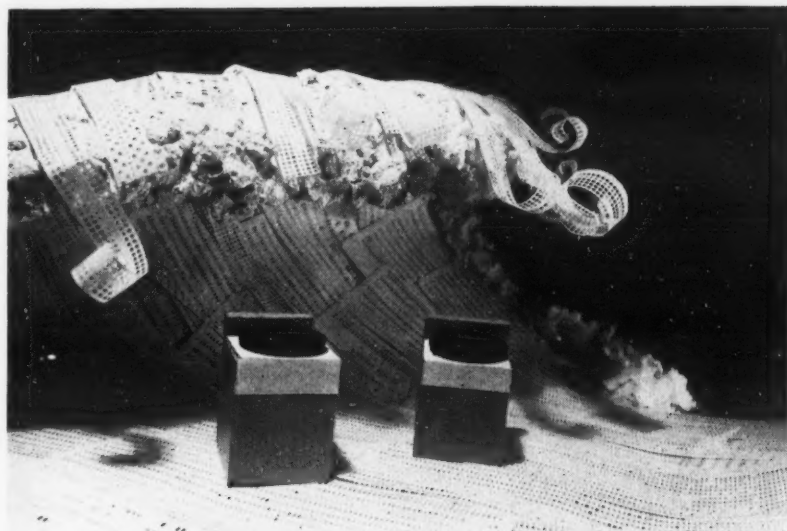
River reservation about 15 miles from Phoenix, FM4 is providing a sharp contrast to the more typical modern-day situation of the New World's original inhabitants. The firm has reported record gross sales of \$600,000 and a net income of \$90,000 for 1977 while poverty, disease, lack of schooling and high unemployment continue to plague American Indians in general.

The firm prepares data for storage on



FM4 Gila River Corp.'s day shift gathers in front of firm's new building on Pima-Maricopa Indian Reservation near Phoenix.

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computer tapes for Petroleum Information Corp. (PI) of Denver, a subsidiary of AC Nielson Co., compilers of technical data for oil and gas exploration and several other companies.

PI spokesman John L. Stout explained how FM4's encoding system works: "FM4 converts oil and gas well drilling history from scouting reports to computer tapes for us to include in our computer-controlled statistical reports. We send FM4 the reports on microfilm. It analyzes them, extracts the pertinent well history from each one and transcribes it to coding sheets for key entry."

"Then it does the key entry on its [communications mode control] key-to-disk-to-tape system and sends the tapes to us in Denver," Stout continued. "This requires that its personnel understand petroleum industry terminology so they can extract and process just those items of information we require."

"Selected FM4 operators learned encoding from our people in Denver and Houston swiftly and went back to train others. At the end of a 45-day trial period, the FM4 operators had surpassed all expectations," he said.

"This is important work, and the efficient expenditure of a great deal of money hinges on the accuracy with which it is done," Stout noted, adding the Well History Control System he manages for PI is now one of the largest existing industry computer files. It contains the histories of more than a million U.S. oil and gas wells

terprises that own the Mesbic Financial Corp. of Dallas, another FM4 stockholder.

Amoco Venture Capital Corp., a Standard Oil of Indiana subsidiary, is another Minority Enterprise Small



Ross Lyons (Pima-Papago) and Andrea Terry (Pima) encode oil and gas well histories for keying.

Business Investment Corporation (Mesbic) that owns FM4 stock.

"The Mesbics give us advice, loans and business," MacKenzie explained, adding that Standard Oil of Indiana executive Martin Stern is on FM4's board of directors.

MacKenzie forecast 1978 profits of \$120,000. His company has just moved into a new, 3,200 square-foot building in the reservation's Pima-Chandler Industrial Park.



Dorothy Eschier (Pima), Rosaline Thomas (Hopi), Janice Johns (Pima) and Lois Pablo (Pima) extract information from microfilm for key entry.

and provides up to 500 independent and distinct items of information for each well.

"Technical evaluation of well histories is one of the most important techniques for finding much needed new oil and gas," he said.

At present nearly 60% of FM4's common stock is owned by its employees and other American Indian interests, FM4 President Roger B. MacKenzie said. However, IBM, Texas Instruments, Inc. and Shell Oil Co. are among a group of Dallas-located en-

A former IBM systems analyst, MacKenzie attributed FM4's success to the dedication, intelligence and high morale of its employees. "The employees are very proud of their company, and three of them are on the board of directors," he said. "Wages are good and working conditions superior."

FM4 lost money through its first four years, broke into the black in 1975 with \$7,000 net income, upped this to \$57,000 in 1976 and to \$88,000 for the first nine months of 1977.

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brightest. The best.

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And we need a lot of those people. Because it looks like our workload is going to double again during 1978.

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You see, a company like Amdahl needs to keep on attracting people who are willing to rethink and improve their future.

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ENGINEERING SOFTWARE

ENGINEERING SOFTWARE INTEGRATION MANAGER

You will be responsible for providing in-process QA for specifications and code, implementing final test/regression testing procedures, and coordinating the release of software, including diagnostic and small systems control programs to users. You have technical management experience in a large software project and will find it helpful to have hardware experience. Please indicate 4271-E on your response.

SMALL COMPUTER SYSTEMS PROGRAMMING MANAGER

You will be responsible for writing control programs for small computers that function as master controllers for Amdahl's CPUs and special test equipment. Your background should include machine and higher level languages, system software/control programs experience, and technical management experience in a large software project. Please indicate 4272-E on your response.

CPU DIAGNOSTICS DEVELOPMENT MANAGER

Your department will specify, review, and implement diagnostics for Amdahl's large CPUs. You will use Amdahl's unique diagnostic hardware and will operate in the environment provided by Amdahl's advanced diagnostics systems. Your background includes knowledge of large system hardware and technical management experience in a large software project. Please indicate 4273-E on your response.

DA PHYSICAL DESIGN MANAGER

You will be responsible for the physical implementation of complex bipolar LSI chips and multi-level PCBs. Your duties will include the evaluation of placement and wiring algorithms, implementation, and integration into a system. You should have technical experience in complex physical design and experience in the technical management of a large software project. Please indicate 4275-E on your response.

DA DESIGN ENTRY MANAGER

You will be responsible for developing new design methodology and entry languages working toward the development of a system to be used in the design of Amdahl's new high-performance CPUs. You have experience in the technical management of a large software project and an understanding of hardware logic design. Please indicate 4274-E on your response.

DA DATA BASE MANAGER

You will design and implement a data base containing the design requirements and physical implementation of Amdahl's high-performance computers. Your background includes knowledge of the MVS environment and experience in the technical management of a large software project. Hopefully, you have knowledge of hierarchical specifications systems such as bills of material. Please indicate 4276-E on your response.

SOFTWARE PROGRAMMER

You will be responsible for the development and maintenance of software programs for computer controlled test equipment. You are experienced in the programming of either the 1130, HPZIMX, or the NOVA computers. You have a BSEE or Computer Science degree and 5 years' experience with test equipment related software. Please indicate 6331-E on your response.

OPERATING SYSTEMS DEVELOPMENT

SYSTEMS PROGRAMMERS

•You will participate in the design and development of current systems programming languages for current and future architectures. You have PL/1, PLS, PASCAL or C experience. Please indicate 4701-E on your response.

•You will be working with an MVS SCP product under development and you will be responsible for the design of methods and the development of technologies to validate the product. You possess a working knowledge of the MVS SCP and are able to develop specialized mechanisms to exercise the MVS supervisor. Please indicate 4702-E on your response.

•You will be working with MVS Source and will develop programs to produce systems programming languages from a variety of inputs. You have a working knowledge of MVS and support documentation and will find it helpful to have PL/1 experience. Please indicate 4703-E on your response.

•You will work to define the software development process including documentation and programming standards and assist in developing project plans and provide continued monitoring of those plans. You should be highly knowledgeable with the development process and be able to assist with and conduct detailed planning. Please indicate 4704-E on your response.

APPLICATIONS PROGRAMMERS

You will design and develop an on-line system for use by both technical and management people involved in the development of software products. You have a working knowledge of the software development process and will find it helpful to have ADABAS exposure. Please indicate 4705-E on your response.

COMPUTER DEVELOPMENT

SYSTEM DESIGN ENGINEER

We seek system/logic design engineers to work in system organization, logic design and the development of new, large LSI computer systems. Hopefully, you are familiar with ECL technology, microprogramming, large computer architectures and higher level computer languages. You have a BSEE/MSEE with a minimum of 2 years' experience in systems or logic design. Please indicate 424-E on your response.

HARDWARE INSTRUCTOR

We seek instructors or field engineers with 5-10 years' experience maintaining 360/370 CPUs. You will be involved in course design including analysis, writing course objectives and lesson plans. You will be a course manager developing students by lecture and case study, using training simulators and state-of-the-art 470 systems as your laboratory equipment. Your other responsibilities will include guidance, counseling, and evaluation. Please indicate 881-E on your response.

PRODUCT PLANNING AND SYSTEMS ARCHITECTURE

PERFORMANCE MEASUREMENT AND EVALUATION SPECIALISTS

You will be a performance specialist on an architectural team as you develop performance measurement and evaluation methodologies and provide support for future product development. Immediate openings are available in the following areas: Computer Systems Performance Modeling and Evaluation, Software and Hardware Measurement, and Workload Characterization. Please indicate 492-E on your response.

COMPUTER SYSTEMS ARCHITECT

You will be a member of an architectural team developing future high-performance computer systems. You should have a solid educational background and broad knowledge of computer and operating system architecture and technology. We have immediate openings in the following areas: Computer System Organization, Operating Systems, Data Base Systems, Storage Systems and the Console System. Please indicate 491-E on your response.

PRODUCT PLANNERS

You should have a thorough knowledge of computer hardware, software and commercial applications, and extensive experience in computer systems planning, development and use. You should be capable of working effectively with management and professionals in Engineering, Manufacturing, Marketing and Finance, as well as with our customers. A combined education in computer science and business administration is desirable. Please indicate 490-E on your response.

QUALITY ENGINEERING

QUALITY ENGINEERING MANAGER

You will be responsible for the implementation, application, and maintenance of quality standards and quality control systems as applicable to the fabrication, production, and shipping of Amdahl products. You will develop operating procedures, instructions, audit programs and controls as well as plan and schedule special projects. You have 5 years of responsible quality control engineering experience including a minimum of 1 year in technical management. You possess a thorough working knowledge of manufacturing processes, inspection methods, and QC systems. BA in Engineering or the equivalent experience required. Please indicate 6805-E on your response.

QA ENGINEERS

You will perform special electrical tests of parts, materials and assemblies in support of QA test and evaluation requirements. You will also plan and schedule lab projects and prepare appropriate technical reports. You have a BSEE or the equivalent experience and 2-5 years' experience in special electrical bench and lab tests of parts, materials, and electronic hardware. Please indicate 6806-E on your response.

ELECTRICAL ENGINEER

You will develop techniques and procedures for performing non-standard incoming electrical tests and will assist MRB QAs in dispositioning rejected electronic hardware. You have a BSEE or the equivalent experience and 2-5 years' experience performing special electrical bench and lab tests of parts, materials, and electronic hardware. Please indicate 6806-E on your response.

COMPONENT QUALITY ASSURANCE ENGINEER

You will be responsible for establishing component quality assurance specifications and implementing appropriate incoming quality assurance screening programs. You will

generate appropriate control documentation, analyze data and prepare reports, establish environmental and test requirements, and evaluate commercial test facilities and equipment. You must have a BSEE plus 2-5 years of directly related experience. You possess demonstrable knowledge of IC failure mechanisms and corresponding screening-out techniques per MIL-STD-883 and other specifications. Please include salary history and indicate 6801-E on your response.

TECHNICAL SUPPORT ENGINEERS

Senior and intermediate openings exist for electronic engineers who will provide technical support for the quality assurance program. You will perform technical analyses and interpretation of failure data; evaluate quality, reliability and performance-related problems; identify test, test flow and test screening problems; prepare reports and initiate corrective action programs. You have a broad systems and component engineering background with a BSEE and 2-5 years' experience in analyzing component, circuit equipment design, test and applications problems. Hopefully, you have experience working with high-speed MSI/LSI components and digital systems. Please indicate 6802-E on your response.

QUALITY CONTROL ENGINEERS

You will be responsible for providing quality engineering support to manufacturing and inspection; generating inspection procedures; establishing quality workmanship standards; analyzing discrepancy and failure data to identify chronic manufacturing problems; initiating and monitoring corrective action programs; and analyzing quality capability of products and processes for complex electronic and electro-mechanical assemblies and components. Junior and senior openings exist for technically competent engineers in the following areas: Electro-Mechanical Assemblies; CRT/keyboard display, power supplies, minicomputer, disk drives, control panels, power panels; multi-layer PCB assemblies; and major sub-systems. We also have openings for QEs in design engineering. These positions require a BS degree with directly related experience in Quality or Manufacturing Engineering with a commercial manufacturer of complex electronic systems. Please include employment/salary history and indicate 6803-E on your response.

QUALITY ENGINEER—FAILURE REPORTING AND ANALYSIS

Your responsibilities will include failure reporting for in-process PCB and systems tests. You will perform gross analyses of failure data, identify chronic test problems and high fallout assemblies. You must have a sound electronics background and a BS degree plus at least 2 years' experience in failure reporting or assembly test. Please indicate 6804-D on your response.

MANUFACTURING ENGINEERING

DESIGN INTEGRITY ENGINEERS

You will be responsible for ensuring that designs are reliable, well specified, perform to spec, are cost-effective, have qualified, dual sources components/assemblies, and have a minimum number of different part types. You have a BSEE or BSME and several years of hardware design experience and/or experience relative to the goals stated above. Please indicate 411-D on your response.

SYSTEMS TEST ENGINEERS

Your background should include experience with final test or field maintenance of medium or large-scale computers or S/370 compatible peripheral controllers. College graduates with EE programs emphasizing digital logic design are encouraged to apply. Please indicate 627-E on your response.

TEST ENGINEERS

Your responsibilities will include the generation of test/troubleshooting procedures as well as supporting manufacturing test equipment problems. Your background should include either test, QA, or manufacturing engineering and a familiarity with ECL-MECL-RAM logics. You have a BSEE or the equivalent experience, and process NOVA minicomputer experience. Please indicate 6332-E on your response.

SENIOR RELIABILITY LAB ENGINEER

You will be involved in engineering and design work in support of various computer system products on materials testing and processes evaluations. Other duties will include the establishment of a departmental manual; development of a calibration, maintenance and service program; and development of a departmental job description manual. You have a solid practical and educational background (BSME, BSEE or the equivalent experience) and at least 10 years' experience in testing, engineering, production and documentation standards and standardization. Please indicate 681-E on your response.

JUNIOR & SENIOR MEMORY TEST ENGINEERS

You will plan and carry out evaluations of memory devices and boards using automated test equipment. Your activities will include memory board interface design and test package development, MOS bipolar device characterization, and the development of statistical tracking programs for production monitoring. You have experience in digital design, basic programming skills and an understanding of memory device characteristics. You possess a BSEE, MSEE or a CS degree. Please indicate 417-E on your response.

MANUFACTURING ENGINEERS

We have several openings for individuals who will be involved in technical line support for the production of state-of-the-art electronics. Your background includes at least 2 years' experience as a manufacturing engineer in the electronics industry and one position calls for some experience in tooling. You should have a BS in engineering, hopefully mechanical or manufacturing. Please indicate 651-E on your response.

PRODUCT ENGINEERS/ SEMICONDUCTOR EXPERIENCED

You will be working with Amdahl systems designers in the selection of components. You will write electrical performance, quality and reliability components specifications (including MOS and ECL RAMS), and will select and perform in-depth qualification of manufacturers' products. You have at least a BS in EE or Physics and a minimum of 2 years' components engineering experience. Please indicate 419-E on your response.

FIELD SYSTEMS PROGRAMMERS

You will be responsible for maintaining Amdahl's excellent reputation in providing software support to Amdahl installations. You are an experienced systems programmer with internals level knowledge of MVS, SVS, VS1, or VM. Your ability to perform system generation and maintenance is essential. Please indicate 805-E on your response.

HEADQUARTERS SYSTEMS ENGINEERS/INSTRUCTORS

You will be responsible for providing headquarters advisory and planning services to our customers, using your knowledge of MVS, SVS, VS1, or VM internals. Software opportunities are available in a variety of areas including Education, Field Support Center and SCP Support Teams. Please indicate 852-E on your response.

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Mini Helps Landlords Screen Out 'Undesirables'

By Tim Scannell
CW Staff

ARCADIA, Calif. — The task of screening out undesirable tenants has been simplified by an agency here that uses a minicomputer to help compile investigative reports on prospective renters for landlords.

The reports contain data on a person's credit history and employment as well as his "habits and patterns of behavior." Such "habits" include whether the prospective tenant is noisy, has pets, pays his rent on time, has children or does an excessive amount

of damage to the apartment he rents, a spokesman said.

Renter's Reference of America, Inc. (RRA), operated on a membership basis, is similar in many respects to credit reporting firms such as TRW Credit Data and the Chilton Corp. In this case, however, the service is geared to the needs of owners or managers of apartment buildings, the spokesman stated.

"Professional" Staff

Unlike most credit reporting services, RRA employs a full-time professional staff of investigators who gather infor-

mation on the rental histories of rental applicants for inclusion in its files, he explained.

Prospective tenants are given a standardized application form when they inquire about an apartment from a member landlord, according to Ronald Pecora, president of RRA's California branch. When a tenant signs this form, he does so "knowing that he will be investigated," Pecora said.

The application is then sent to the RRA office and checked against the computerfiles to see if there is any existing information on the tenant. If information does exist, it is passed on to the client landlord.

"If we do not have a file, we use the information from the application" to compile a report, Pecora said. "We do this by making phone calls and searching through other sources that we have."

Phone Checking

A number of avenues are explored in an investigation, both to check on the tenant's honesty and his financial standing, Pecora noted. "We usually check out their last three locations, their banks and their employers. Our people call the landlords where the person has been living" to verify what he has put on the form and "call the banks to see if he has a bank account."

Employers are called to ask "if the person has been working there as long as he said he was, if he is making what he

says he is" and if there is a possibility of his being fired in the immediate future, he stated.

In addition, landlords can submit positive or negative appraisals of previous tenants for addition to their files, he said.

The reports are processed and updated using an NCR Corp. 399 minicomputer with 14K of memory.

Files Open to Tenants

If a tenant is rejected, a landlord will tell him that the decision is based upon information supplied by Renter's Reference, Pecora said. The tenant can then go to RRA and review his file after giving sufficient proof of identification.

"We then go through the report and see what's derogatory about the person" and discuss "why the management company has turned him down," Pecora said.

"We do not make a judgment," he stressed. "That is the job of the manager or the landlord."

If a person feels something is wrong with the file in its presentation of facts, "he has to go to the complaining party, straighten the matter out and send a letter to RRA" stating he has corrected the situation, Pecora said.

Although he described the system as being "better than what most people use," a percentage of error does exist, Pecora pointed out. One particular problem involves landlords who exaggerate on tenant reports, overplaying a person's negative qualities.

"There is a tendency to do that with any type of reporting," Pecora observed. Unfortunately, "you really don't find out about it until six months down the road" because there is no way to im-

mediately discern if a landlord is fabricating a tenant's undesirable aspects.

"Most people, unless it's a small landlord who hasn't been in the business too long, know they are going to get themselves into trouble if they lie," he said.

An even more prevalent problem concerns landlords who give "glowing recommendations" to tenants whom they want to "get rid of," Pecora stated. "If one landlord submits an overly positive review and the others we receive are all decidedly negative, his will not be taken into consideration."

Reverse Use

"Editors" at Renter's Reference sift through the various reports and evaluations and isolate the ones that seem to be unfairly biased. Any reports claiming excessive damage or noise are investigated to establish their authenticity, Pecora said.

All in all, "the system works fairly well," he added. "We've had very few problems and we've never been sued or anything like that."

A few people have even used the service in reverse. "If a tenant is noisy, has too many kids or animals or did a lot of damage to his last apartment, he might ask [what landlords are] not contracting our services," Pecora explained.


The California office was established in 1977 and currently handles tenant traffic for 10,000 apartment units. Members are charged an annual \$100 fee plus \$5 for a basic "minireport" and \$9 for a full-scale investigative survey.

The service is governed by laws set forth for investigative reports under the Fair Credit Reporting Act, the spokesman noted.

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Discussion of Passwords Available on Paper, Fiche

WASHINGTON, D.C. — The National Bureau of Standards (NBS) has announced availability of "The Use of Passwords for Controlled Access to Computer Resources."

After describing the need for and uses of passwords, pass-

word schemes are categorized according to selection technique, lifetime, physical characteristics and information content, NBS said.

Password protection in storage and transmission is discussed, as are current implementations and cost considerations.

Copies of the paper, SD. No. 003-003-01770-1, can be ordered for \$2 each from the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402.

Microfilm copies, catalogued as NTIS No. NBS-SP-500-9, are available for \$3 each from the National Technical Information Service, Springfield, Va. 22161.

System Helps Ensure 'Correct' MVP Award

ATLANTA — Time is the culprit that may have contributed to selection of the "wrong" Most Valuable Player (MVP) in National Basketball Association (NBA) All-Star Games in years gone by. And it might have occurred again in the Feb. 5 All-Star Game if it hadn't been for computer processing.

Because of the time needed to collect and manually tabulate the ballots, the nearly 300 sportswriters and sportscasters who elect the MVP have had to cast their vote at the midpoint in the fourth quarter.

But this year, for the first time in NBA history, they were able to hold their ballots until the final buzzer — and it's a good thing. With only five minutes and 10 seconds remaining, the East All-Stars, having trailed for the entire game, took the lead and held it for a dramatic 133-to-125 win.

Less than one minute after the final buzzer, a Honeywell Information Systems, Inc. Level 66 computer proclaimed Randy Smith of the winning East team the MVP, and CBS Sports covered the presentation of the NBA's

MVP trophy and keys to a new Chevrolet.

Historically, the MVP has been a member of the winning team. If HIS had not computerized the tabulation of the votes, the ballots would have been collected while the West was still ahead — and a lot of sportswriters may have nominated a member of the team they would later see lose the game.

The system was set up with groups of terminals situated near the tables where the voting sportswriters and sportscasters were seated.

At the one-minute-remaining point and then at the final buzzer, volunteers from HIS collected the ballots and rushed them to the nearest terminals where others were ready to input the data.

Each terminal was connected by dial-up phone lines to a Level 66 at HIS's data center in Atlanta. (As a backup system, each terminal was also tied to the firm's data center in Phoenix.)

Entering the votes into the terminal took a little more than a minute, HIS said.

EPA Using Dial-Up System To Check Up on Witnesses

By Ann Dooley
CW Staff

DENVER — A computer is now being used to discredit expert witnesses whose testimony in environmental court cases and administrative actions can mean gains or losses in the millions of dollars.

Used by the U.S. Environmental Protection Agency (EPA), the computer system checks out the credentials, past experience and expert testimony of scientific witnesses opposing the EPA in various types of actions.

The system also helps prepare the testimony of the EPA's own expert witnesses.

Using a portable terminal and dial-up lines, members of the EPA's National Enforcement Investigation Center can access about 95% of the world's scientific and technical papers, according to John Lattimer, an EPA spokesman.

This includes articles in some 50,000 scientific journals published within the last 15 years and stored in commercial data bases, such as Lockheed's or in the world's network of libraries, government agencies, private research groups, Congressional records and the Science Citation Index, Lattimer said.

Some of the information gathered includes where witnesses on the opposing side have worked, what papers they have published, in what kinds of research they have specialized, whether they hold any patents and who gives them the grant or contract money to do their research. Also, past connections with the industry for which they're testifying sometimes come to light, according to Lattimer.

Contradictory Testimony

The system has another advantage, too. Previously, when a witness in a case made a statement that was misleading but not so inaccurate that it was obvious to attorneys, it was over-

looked. But now, with the help of the system, attorneys can identify testimony that contradicts that of another witness or even a statement made by the same witness in answer to previous questions, according to Dr. Douglas Seba, also of the EPA.

Time is a critical factor, according to Seba. In the past, it was impossible to gather enough evidence to refute statements from the opposition because there wasn't enough time for a complete search. But the computer has enabled the EPA to search for the data, gather it and validate it within 48 hours, according to Lattimer.

Previously, the most credible and believable witness would convince the judge in a hearing, but now there's a chance to break that testimony.

In one case, an opposing witness withdrew his testimony rather than face the computer system, Seba claimed.

In a sense, the system works for both sides, Seba said, because "all witnesses involved will strive for the highest credibility, knowing their expert opinion is truly open for inspection when under oath on the witness stand."

In addition to refuting the opposition's evidence, the system provides comprehensive background in preparing EPA enforcement actions. It is important to know everything about a chemical, for instance, before taking any action on its use, Lattimer said.

In a recent case, there were 17 days of petitioner cross-examination and 87 hours of on-line time charged by nine suppliers of data bases for the use of 62 technical files. More than 10,000 citations were reviewed and total on-line time cost about \$3,200.

These expenditures were less than 20% of the cost of manual searching and less than 10% of the cost of batch searching, and the results were more comprehensive, Seba noted.



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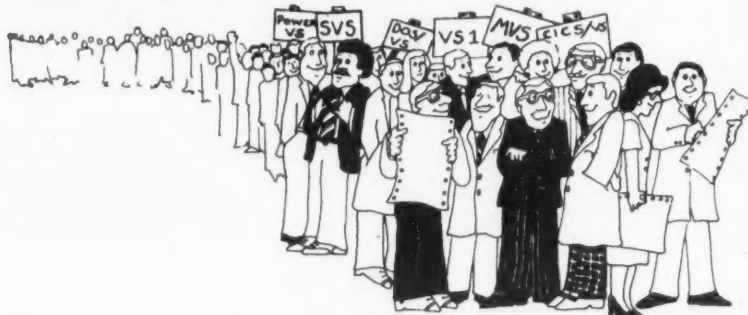
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Editorial

Sites for Sore Eyes

There's good news and bad news on the CRT front.

First, the good. The National Institute for Occupational Safety and Health (Niosh) has found CRTs do not emit radiation that could harm the workers using them [CW, Feb. 20].

However, the government agency did note that continual viewing of such devices can lead to eye strain and fatigue, particularly when the working environment is not designed with CRTs in mind. With between 5 million and 10 million CRTs in use in the U.S., it is a good bet many are located in high-glare areas, causing eyestrain to the people who have to work with them regularly.

There are many steps users of CRTs can — and should — take to help reduce operator eye fatigue. For example, the equipment should be used in areas where there is a minimum of glare on the screen. Further, users can program the systems to produce short columns —

like those in a newspaper — instead of forcing people to read a line that spans the entire screen.

Users should also survey the areas where CRTs are in use — particularly those areas where the systems are in use all day long by the same operator — to identify necessary changes.

Furthermore, users need to be more aware of the possible hazards associated with using DP equipment.

In designing systems, the human element should be taken into consideration more often. By designing for operator comfort, manufacturers can help to not only make the work place a bit more humane, but also head off problems that might crop up in the future.

After all, if a system is hard to use, people will tend to resist it. Even the most elegantly designed system from the DP point of view may fail its user if the human interface is poorly planned.

Patchwork Problems

President Carter has promised a major reform of the tax laws during his administration and while that may be good — or bad, depending on your politics — for the public, it is sure to create a headache for DPs.

Recent changes in the reporting requirements for Social Security have already set off one flurry of reprogramming [CW, Feb. 13] and any other changes in the law are sure to set off more efforts in this area.

The Administration and Congress

should enact tax reform measures all at one time, causing DPs just one major effort rather than many separate patch jobs.

Unfortunately, this will probably not happen, and almost every business DP shop in the country will have to face continual patches of its payroll programs for the next several years.

DPs need to keep a careful eye on Washington for the changes that surely will come along. A lot of fancy footwork is going to be required to keep up with the changes.

Letters to the Editor

Out of This League

It is no wonder Barry Starkman ["Any Advice for DP Grad Looking for Job?" CW, Feb. 13] hasn't been hired as an entry-level programmer — he doesn't meet the illiteracy requirement.

After all, what programmer writes short, coherent sentences without misspelled words?

I am sure the DP manager who reviewed his resume couldn't read it since he most likely was a programmer at one time. Unless Starkman has a programmer ghostwrite his resume, he will remain in the ranks of the unemployable. I suggest he try journalism.

Don L. Weimer
Columbus, Ohio

Good, Bad News at ACM

In response to "Write-Ins Join ACM Election Slate" [CW, Feb. 6], I have some good news and some bad news.

The bad news is that a nominating committee, by its nature, cannot nominate everyone who aspires to office. Hard choices must be made after long hours of discussion.

The good news is that the ballot may be enlarged by the petition process. I personally encouraged some of the present petitioners and signed their petitions.

Olin G. Johnson
Chairman
Nominating Committee
Association for Computing Machinery
Houston, Texas

'It Ain't What You Get'

Thomas D. Barr's letter [CW, Feb. 13] was very disturbing. It appears

by his response that the U.S. vs. IBM antitrust suit is turning into a secret trial.

Barr's letter implied the IBM lawyers, IBM, the Justice Department antitrust desk and the judge are the only people who know what is going on behind the scenes of this very important suit.

Barr, in effect, was saying, "What you see ain't what you get." It seems the parties listed above are the only ones who will be involved in the secret negotiation settlement on this very important antitrust suit.

It is clear that those injured by IBM monopolistic actions will never be heard from or gain relief in the future. They are only pawns in these supergovernment, super-business transactions.

George S. McLaughlin
Summit, N.J.

Consider the Source

The "prediction" by Adolf Monosson about the pending demise of the 370 leasing community ["Dealer Predicts 'Bloodbath' for 370 Lessors," CW, Feb. 6] would be laughable had it not appeared in a reputable publication such as *Computerworld*.

Monosson is not in the leasing business. The key point to bear in mind is that any upward or downward fluctuation in the price of used computers — fanned by "predictions" like this — means business for Monosson and his company.

Such business is apparently far more important to him than either facts or common sense.

James F. Benton
Executive Director
Computer Lessors Association, Inc.
Washington, D.C.

Data Past

Five Years Ago Feb. 28, 1973

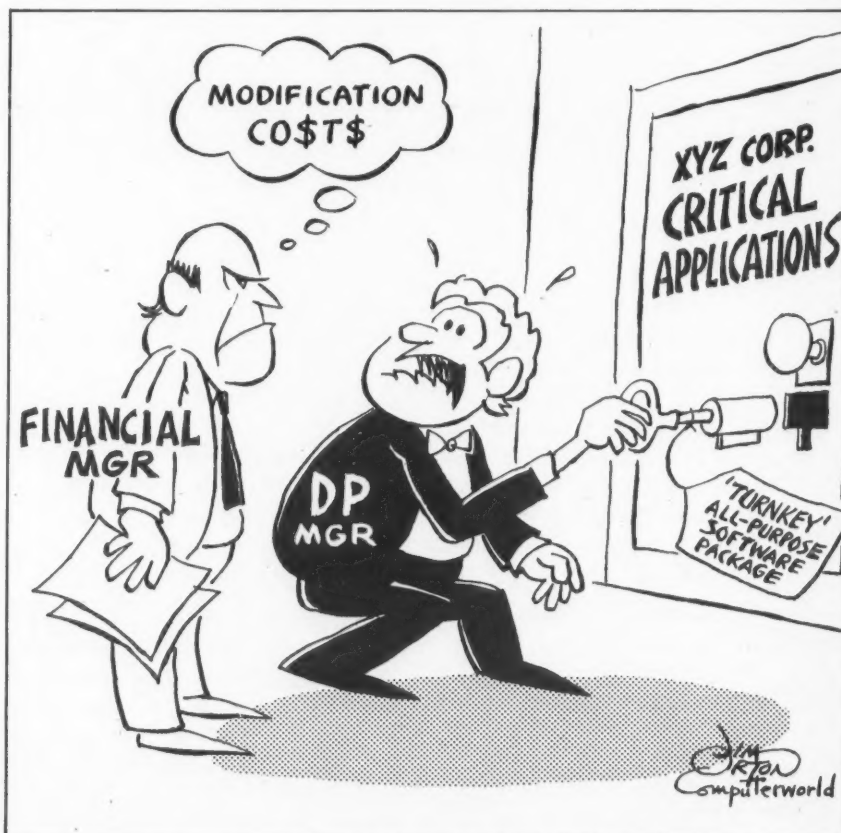
SAN FRANCISCO — A Service Bureau Corp. (SBC) employee here filed a \$100 million class action suit in district court against IBM charging that the transfer of SBC to Control Data Corp. deprived SBC employees of important IBM benefits. Some of the benefits named in the suit were the right to purchase stock below price, military benefits and the career progression through IBM.

WHITE PLAINS, N.Y. — IBM informed its customers it would no longer provide hourly machine time at its data centers for production work. CPU time would be restricted to "program testing and other activities, including conversion, directly related to program testing." Those services would still be available to "users and prospective users of IBM products."

Eight Years Ago March 4, 1970

WHITE PLAINS, N.Y. — IBM filled in the major gap in System/3 capabilities with the announcement of a communications adapter that allowed the System/3 to be used as a communications terminal, exchanging data with other System/3s and all models of the IBM 360 series, except the 360/44, over telephone lines.

WELLESLEY HILLS, Mass. — Honeywell announced its Model 115 disk-oriented system, aimed at bolstering the lower end of the Series 200 family of computers. Designed for the first-time user as well as users of such competitive small systems as the IBM 360/20, NCR Century 100 and Univac 9200, the 115 was priced in the \$2,500 to \$6,000/mo rental range, placing it between the 110 and 120 in the Honeywell 200 series.



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Power Motive Apparent in Manager Profile

By Jack Stone
And Ida Mason
Special to CW

Everybody talks about good DP management, but few agree on just what it is that makes a good DP manager.

David C. McClelland and David H. Burham recently coauthored an article in the *Harvard Business Review* that draws upon academic theory and empirical research to reach some sensible and definitive conclusions on the characteristics of a good manager. This work plus some of our own ideas form the substance of this column.

Let's first examine the employee's perspective. Research data indicates that subordinates describe successful managers as people capable of motivating the work force; they instill feelings of responsibility, a sense of organization and team spirit in their workers. These same managers were also perceived as doing more and doing it better.

Now let's look at the question, "What driving forces — motives, needs, strivings, desires — are consistently found in successful managers?"

One is the "achievement motive." This is a strong need to succeed — a desire to do things better and more efficiently than before. In small organizations, this motive may be the key to survival, but it must be tempered for effective management of larger organizations. This is so be-

cause individuals motivated by achievement tend to expect relatively rapid progress in meeting work goals, and if they can't move and shake the bureaucracy, they will try to do the job themselves.

This situation exists in a good many programming organizations.

Another force behind successful managers is the "affiliation motive." They think of themselves as "nice guys" and certainly want to be liked. They believe they can empathize with their employees and respond to their feelings.

Again, this force must be kept under control. Otherwise, these managers may create negative feelings in their subordinates who may perceive undue fraternization with the staff as favoritism. We have seen a number of operations departments where this case was apparent.

Most Significant Need

A third drive, and quite frankly the most significant, is said to be the "power motive." This need to have "impact," this desire to influence others, may be the most consistent characteristic of the successful manager.

It can take two forms. The first results when the person has an overweening need for self-aggrandizement and ego gratification. The second is the altruistic, institutionalized form; in which the drive is socialized and controlled. Better managers fall into the latter group, but unfortunately, many DP

managers are identified with the former.

By way of amplification, we should note that mature individuals of any age are definitely short on egotism. They are not defensive and take advice. They view the "total picture" and their self-image is positive enough so that they do

orderly manner.

Third, they are not above sacrifice when the welfare of the firm is at stake. Self-interest is not as important to these people as the need to serve.

Fourth, they have a sense of justice and believe that one who sacrifices and works hard will eventually be rewarded.

There are several conclusions one can draw from the discussion. First, the considerations described above are only intended to provide a basic framework for understanding the mental makeup of the successful manager. Interested readers should pursue the subject with additional study.

Second, the reader, as an exercise, might wish to evaluate his own self-image against the points made in the discussion. It might stimulate a serious evaluation, a better understanding of power and other motives and how they can be developed and controlled.

And finally, schools of business around the country appear to be taking an increasing interest in the psychology of management. According to Dr. Donald Hudson, professor of management at the University of Miami, "a required course in Power 101 is just around the corner."

Ida Mason, a professor of DP at Lehigh (Pa.) Community College, is currently on sabbatical doing research on women in management.

The Human Connection

not feel their job is on the line every time they make a decision.

And with regard to control, although several individuals may have the same power motive, the more successful ones are likely to control their acts. They are more democratic than authoritarian in dealing with subordinates so as to promote strengths and help people overcome their weaknesses. In short, they coach, not coerce.

Subsidiary Characteristics

Let us mention four subsidiary characteristics commonly found in successful managers. First, they tend to be joiners and usually belong to many organizations. They also feel a serious responsibility to help build these groups.

Second, they seem to thoroughly enjoy their work. They like the work ethic and derive much satisfaction in seeing things done in an

Readers Document DP-Controlled Rip-Offs

Computer-controlled rip-offs of consumers in this country, according to my mail bag, consist of the 10 following methods:

- Printing accounts receivable statements without credit balances.
- Printing accounts receivable statements with credit balances, but not mailing them to the persons to whom they are owed.

• Printing a special report of suppressed credit balances for credit department use in the event of an investigation.

• Dropping all credit balances when an account is inactive for a year.

• Printing a code on credit balance statements that allows them to be segregated for further action.

• Maintaining a correct credit balance then waiting to see if the customer claims them. If it becomes obvious the customer is unaware of the balance, writing it off.

• Suppressing notification of mistakes that favor the customer while notifying him of mistakes that favor the seller.

• Maintaining computer balances that show untrue balances for customers by confusing rental payments due with retail value.

• Always rounding off amounts

against the customer.

- Creating "administrative transactions that wipe out small credits without notifying customers.

Who, Where and Why

Ten types of businesses are most often cited as using these methods. They are banking, mortgage banking, manufacturing, service bureaus, mass merchandisers, retailers, catalog stores, medical billers, wholesalers and sellers of schoolchildren's supplies.

No particular geographical area seems to be involved. Complaints are coming in from all over.

And the frequency of those complaints appears to be considerable. The highest range of figures I have puts the frequency of potentially abusing situations (credit balances, for example) at more than 15%.

What justifications are used? The most common are, "It's accepted business practice," "The dishonesty of our customers is greater than our dishonesty," "Our job is to match the specifications, even if the specs cause incorrect results" and "The system is correct if it accomplishes management-set goals."

What happens when an employee of a firm that uses rip-off techniques questions them? The methods of handling such questions are not very varied, consisting of evasion (bypassing the DP manager or another responsible authority) or direct or indirect threats of the questioners dismissal.

Here are some of the comments I received from readers:

- "When I spoke out against this practice (dropping inactive credit

balances), I was told, 'Just do it.' "

- "In most instances after pointing out the situation, I am required to

(Continued on Page 25)

Headhunters vs. Confidentiality

1. Are you aware of any cases in which mere circulation of a resume was regarded as grounds for dismissal? _____

2. Have you known cases in which a job applicant's name was released without his approval to his boss? To anyone else? Please describe: _____

3. Have you known of any policy or any other mechanism that would cause a "headhunter" to release a job applicant's name without approval? _____

4. Are you aware of any attempts by employers to obtain the unauthorized release of names from job agencies to monitor employee activities? _____

5. Do you know of any methods that have been tried to combat agencies' unauthorized release of names? Did they succeed or fail? _____

Name _____ Position _____
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Thanks to DP, Rhymesters Can Rest Easy

By Sherwood Springer
Special to CW

By sheer chance, a lack of tight programming recently solved a problem that has nagged a certain esoteric group for several hundred years.

This concerns the search for a rhyme for the word "orange," traditionally No. 1 on the list of English

words which, because of their unique rhyming structure, have frustrated generations of versifiers.

More than 40 years ago "porringer" was suggested, using the suffix as an end-around; that, to our knowledge, is the best anyone has been able to do.

Until a few days ago.

As you may know, the type for

many newspapers nowadays is set by a photographic process entailing a keyboard-operated input of copy. A computing unit measures the

Reader Commentary

copy into lines to fit the newspaper's column width.

When word divisions are necessary at the end of lines, programming is supposed to indicate proper division by syllables. But, as you must have noticed in your daily reading, the results are occasionally weird.

Thus, the following two lines recently appeared in a news story comparing President Carter's handling of options to that of his predecessor:

policies, both domestic and foreign, Jerry Ford, unlike Carter, was generally

Like the mold spore accident that led to the discovery of penicillin, this slip has provided us serendipitously with "foreign-j" — or, more simply, "foreignj" — a singularly happy rhyme for orange. May rhymesters all around the world sleep well tonight.

Springer is former financial editor of the Springfield, Mass. Republican.

Readers Detail Rip-Offs Perpetrated by Computer

(Continued from Page 23)

meet the specifications, and it is the specifications that determines when I am paid."

• "As a DP manager, I have had upper management bypass me to get their slippery deals pulled off."

Complicating Problem

A different problem appears to be complicating the issue. This is the failure of "head hunters" to keep one's name from being revealed to a boss.

A New Jersey reader wrote "In recent months I have personally known two cases in which a friend submitted a resume to an agency without permitting its circulation. Within a few days, his manager was aware that his resume was on the market... recently I was informed that if my resume were on the market, my manager would know of it and I could be dismissed."

If this is true or even feared as being true, it could effectively prevent the standard approach that lets people stay clear of unethical problems simply by changing jobs. As one reader put it, "You change jobs so much to find an ethical firm that your resume makes you seem like a gypsy."

Do any other readers find "confidential" resumes getting back to bosses? Do any know how? Is the placement agency for example, told it won't place anyone with the firm unless the names of employees looking for jobs are leaked?

Or are resumes simply circulated freely despite restrictions on circulation? Is it the "old-boy network." Has anyone found any answers to this problem that suc-

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See page 7 for more details.

BUYING HARDWARE

Pros



Photo courtesy of Computerland of San Francisco

Cons



Computerland, the DP Department Store. Hazeltine & Diablo on Display.

Time was, buying hardware meant dealing factory direct. Then came the distributor, or factory indirect. The phone/mail order ad reads, "15% off." 15% off what? Delivery schedule maybe. After sales service perhaps. The only real savings just might be the Toll Free number in the ad.

Now there's an alternative. Introducing Computerland, a national network of DP equipment stores, with outlets across the nation. This means you, and the DP director, programmer, general manager or purchasing agent can take a quick ride across town, try out working equipment in a user environment, make product comparisons, then drive off with the hardware of your choice. And, still be back in time for the afternoon coffee break.

Below is a sampling of the quality business information products, from more than 60 manufacturers of micro and mini-computer systems and peripherals, available for you to try out, buy or lease and take home today from Computerland.

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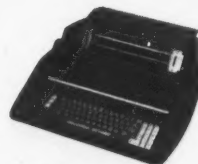
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Can't Eliminate Satellite Delay

"Firm Uses Device to Cut Satellite Delay" [CW, Feb. 6] contained some implications and statements that are misleading.

It stated that the device provided by American Satellite Corp. is used by General Felt Industries "to eliminate propagation delays."

The fact is that propagation delays cannot be eliminated. The signal must travel to the satellite and

back down again and that takes a finite period of time.

Additional delays occur in the ground stations and the satellite itself. Nothing can change the fact that a coast-to-coast satellite circuit covers over 40,000 miles while the equivalent terrestrial circuit is under 3,000 miles.

Although the propagation delay cannot be eliminated, the effective throughput on the circuit can be increased

by a variety of means to partially overcome its effect. However, as described, the system is primarily overcoming difficulties imposed not by a circuit, but by a poor communications protocol.

Clark N. Okun
Montclair, N.J.

Consent Order Violation?

Our Seattle Regional Of-

fice has forwarded for our information a copy of Alan Taylor's column "Saks Billing System May Violate ICCP Code" [CW, Dec. 26-Jan. 2].

Two statements in the article, if factually accurate, suggest the named company may be in violation of a Federal Trade Commission consent order.

The statements are as follows: "Where merchandise

is returned and credited, but where the account remains inactive the credit is placed in some archives making location difficult throughout the system," "Billing statements inform only that the person concerned owes all the current transactions but fail to give the consumer credit for the true balance in the consumer's account because it is located in the archives."

The procedure described would be inconsistent with the requirements of a Consent Order entered by the commission against Gimbel Brothers, Inc., of which Saks is a division.

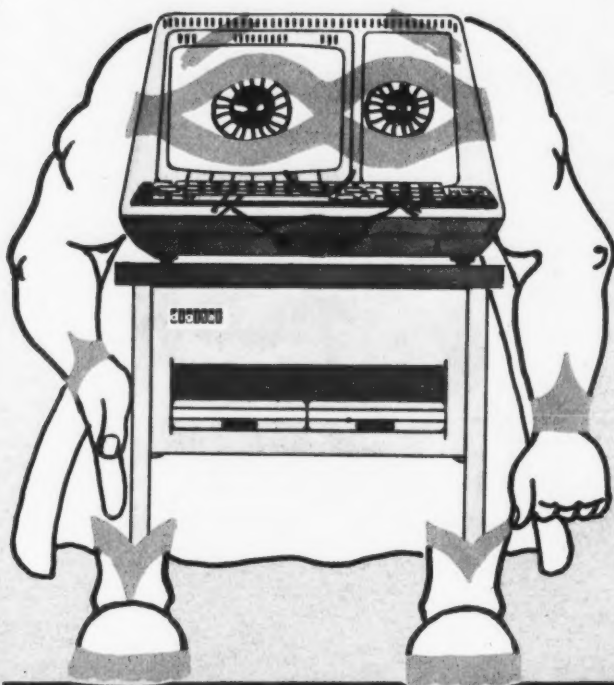
That order provides in part that the respondents must cease and desist from writing off or deleting any credit balances of more than one dollar from the customer's account before the respondent has made a cash refund or the customer has made a fully offsetting purchase.

We would appreciate any information that supports the part of the article cited above.

Justin Dingfelder
Deputy Assistant Director
for Credit Practices
Federal Trade Commission
Washington, D.C.

Taylor said his material will be forwarded. Other people may wish to contact Dingfelder directly. Ed.

Computerworld welcomes comments from its readers. Preference will be given to letters of 150 words or less. Letters should be addressed to: Editor, Computerworld, 797 Washington St., Newton, Mass. 02160.



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Even Though He's Loyal . . .

Late Software Delivery Hurts B80 User

By Don Leavitt
CW Staff

McALLEN, Texas — Hector Villarreal thought he had a perfect timetable for installing a Burroughs Corp. B80 and its companion Commercial Business Management System (CBMS-II) software. But things didn't work out as smoothly as he had hoped.

Various setbacks — some of Villarreal's own making, but principally delays by Burroughs in delivering both the hardware and the software — have left the comptroller (and part-time programmer) of M.W. Fruit Co. still putting together a system he had expected to have up and running last September.

September was an important target for the company, which grows and packs citrus fruit, because it marks the start of its active season, a season that doesn't end until May. Villarreal had been promised that the B80 and all the modules on CBMS-II would be delivered in June 1977, which would have allowed time for customizing and the rest of the preparation needed to ease the fit of user and system.

Having had one, and then two, Burroughs magnetic ledger card systems before ordering the B80, Villarreal was well acquainted

with the vendor and perhaps in a better position to cope with DP chores than some users of the small business system.

He programmed the initial B80 application, for example, to support a subsidiary of M.W. Fruit that supplies fruit to civic groups for fund-raising drives.

But Villarreal was counting on the CBMS-II modules to handle most of the company's work, and "one of the most effective parts of Burroughs' sales pitch was that all the software to support the B80 would be ready in June, when the hardware was to be de-

livered, or July at the latest.

Slipped Deliveries

Burroughs in fact slipped delivery on the B80 till August and even worse on the software.

"Actually I got the first application in August, the second in October, the third in November . . . and I still lack the accounts payable package," Villarreal said. Despite having now phased in general ledger and accounts receivable and working on payroll, the missing "payables" really bothers him.

Accounts payable is more im-

portant to M.W. Fruit Co. than most of the other applications he said, and it could have been implemented fairly easily because it doesn't require a severe change in the user's way of doing things — "but the programs are still not available and that hurts."

Villarreal's reluctance to impose changes on internal systems during the active season is one of the main reasons he hasn't pushed ahead with invoicing and inventory control at this time. It's also obviously the reason he wanted the software last summer, when

(Continued on Page 28)

'MFE/IV' Extends Four-Phase Use

CUPERTINO, Calif. — By the end of the year, users of Four-Phase Systems' System IV/90 processor with expanded memory reportedly will be able to handle a range of functions on each of the CRTs linked to the small business system instead of dedicating the units to specific functions.

This flexibility will be made possible by the Multifunction Executive (MFE/IV), which supports data entry operations, execution of Cobol programs, word processing and interactive in-

quiry against files residing within an IBM 360/370 mainframe, Four-Phase said.

Users are free to switch from one function to any other at any of the 16 1,920-character CRT units that can be attached to a single System IV/90. Activity at one CRT has no effect on what can be done at any other; MFE/IV dynamically allocates CPU and I/O resources to optimize system performance, a spokesman claimed.

Existing software supported by the executive includes Four-

Phase's Data IV, Vision, Foreword and Cobol runtime system. Cobol programs can be compiled in batch mode for use under MFE/IV, he said.

Data IV was designed for data entry operations and provides support for CRT screen formatting, while Vision is a transaction-oriented access technique for working with files at the System IV/90 or at the host mainframe. Foreword supports word processing.

Users working under MFE/IV can transfer from one mode to another "on the fly" to put together the work they have to get done.

To support MFE/IV, Four-Phase announced two memory modules for the System IV/90, expanding storage capacity from 192K bytes to either 288K or 396K bytes.

Monthly cost of a 288K system with appropriate disk drives, 16 CRTs, line printer and communications controller is \$3,522 on a 42-month lease. This includes MFE/IV — scheduled for delivery beginning in the fourth quarter.

Four-Phase Systems is at 10700 N. De Anza Blvd., Cupertino, Calif. 95014.

'RTSort' Supports PDP-11 Shops

NASHVILLE, Tenn. — A disk sort for Digital Equipment Corp. PDP-11 minicomputers running under DEC's RT-11 or CTS-300 operating systems has been announced here by S&H Computer Leasing, Inc.

RTSort requires a minimum of 16K bytes of main memory and typically needs less than 1.1 times the input file space to store temporary sort files on disk, according to a spokesman. The sort can be run directly, chained from Dicol or Fortran programs or run as a detached job called by user

message packets, he added.

This assembly language program handles both fixed- and variable-length records; the user can specify up to 16 sort keys, the firm said, noting key types include signed and unsigned binary integers, single- and double-precision floating-point numbers, Ascii character strings, dates and Dicol numbers.

The following sort times are said to have been attained while running RTSort on a PDP-11/10 with 56K bytes of memory and RK05 disk drive; input data con-

sisted of randomly ordered 80-character records:

Number Of Records	Time (Min:Sec)
1,000	0:15
2,000	0:25
5,000	1:02
10,000	2:08
15,000	3:45

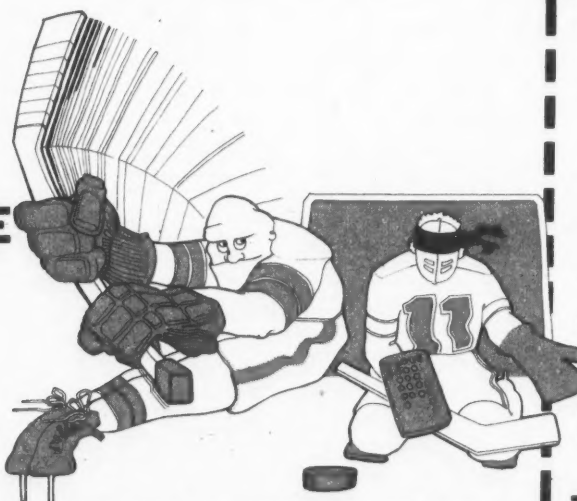
Priced at \$450, RTSort is distributed on floppy disks from S&H Computer Leasing, 3709 Trimble Road, Nashville, Tenn. 37215.

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SOFTWARE & SERVICES

Sierra Gives PDP-8 Users Added Support for Micros

RENO, Nev. — Sierra Digital Systems is offering four microprocessor cross-assemblers for the Digital Equipment Corp. PDP-8 minicomputer.

The X8 series cross-assemblers now cover the Z-80, 1802, SC/MP and 8048 microprocessors in addition to the previous 6502, 6800, 8080, F8 and 2650 versions.

Sierra Digital's cross-assemblers run in 8K words of memory under DEC's OS/8 environment. They are written in the PDP-8 assembler language to provide fast execution with minimum memory use, according to a spokesman.

Assembling micro programs on a mini leaves the micro free for "live"

work while new coding is being developed, he noted.

Within the X8 packages, pseudo-operations and runtime options provide for conditional assembly and extensive listing control. Generated object code can be output in the microprocessor's standard loader format or in BNPF for read-only memory (ROM) generation.

Each cross-assembler costs \$400 and is distributed in DEC PDP-8 binary format on paper tape, magnetic tape or floppy diskette.

Source files are also available for an additional \$250, the company noted from 13905 Rancheros Drive, Reno, Nev. 89511.

SCMG Plans March Meet

JACKSONVILLE, Fla. — The Holiday Inn South here will be the scene for the next meeting of the Southern Computer Measurement Group (SCMG) March 16 and 17, according to program chairman Al Cartledge.

Topics to be considered include capacity planning as well as performance of Cobol and of IBM's Information Management System (IMS) software. Presentations of new

products or services by both Comten and Tesdata will also be part of the program, he noted.

The meeting is open to anyone interested in computer performance measurement, evaluation and enhancement. There will be a registration fee of \$15/person, which includes a luncheon. More information is available from Cartledge, Celanese, P.O. Box 1414, Charlotte, N.C. 28232.

Package Aids Datasystems

SUMMIT, N.J. — Print IV, a "query-type" report writer that runs on Digital Equipment Corp.'s larger Datasystems based on PDP-11s, is

now available from Symbolic Systems, Inc., a spokesman said.

The utility allows the user to select the data, sequence, format and control totals to be used in generating any desired report. Print IV is end user-oriented, requiring no programming skills, the spokesman claimed.

A clerk can set up a procedure he added, since the system is interactive and the instructions can be entered in free-form style. Beyond that, Print IV supports the storage of completed procedures so they can be recalled for use through symbolic names.

Print IV costs \$3,500 from Symbolic at 25 Chatham Road, Summit, N.J. 07901.

Delays Disturb Loyal B80 User

(Continued from Page 27)

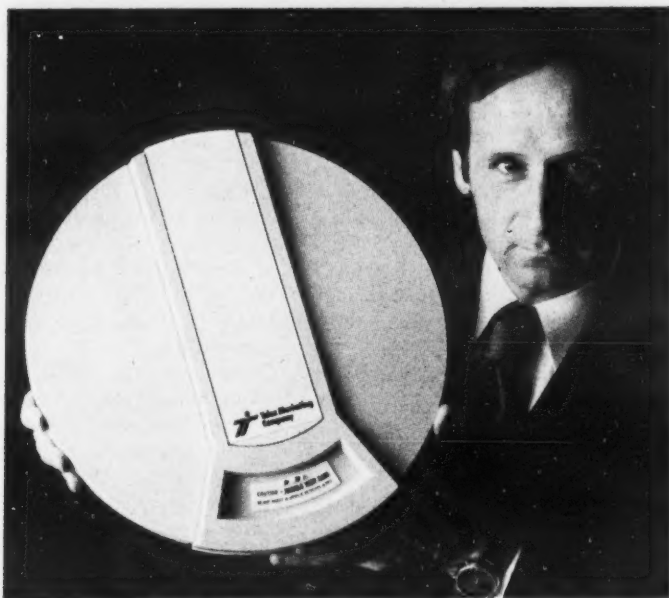
the systems could have been set up before the season started.

With little local help available from Burroughs — McAllen is about 350 miles from Houston, 600 or 700 from Dallas — Villarreal is working his way through the documentation provided with the software, but that's a slow process. He had hoped the manuals would be "a little more instructive" for persons who, like him, can't get away to the classes Burroughs offers on the applications.

Pleased with Help

Although he'd like to see Burroughs beef up local support, the comptroller is a realist and seemed pleased with help he had gotten over the phone from Houston and Dallas. There are several other B80 users in this southernmost tip of Texas, but Villarreal believes his is the only shop going with the CBMS-II software.

Still loyal to his supplier, he is nonetheless glad to have a friend who is installing a Burroughs B800 and phasing in his applications much as Villarreal is. "We work closely together. We talk the same language, so that helps," the M.W. Fruit Co. official explained.



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dures are the best in the industry, which means your product is more reliable and your service dollars go a whole lot further.

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In fact, why not get started right away? For more information, write Perkin-Elmer Data Systems Sales and Service Division, 106 Apple Street, Tinton Falls, New Jersey 07724 or telephone toll-free (800) 631-2154.

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APL File Handlers Offered

ATLANTA — Three separate file-handling extensions for IBM's APL-SV software are now available from Interprocess Systems, Inc. Following APL convention, the packages have been labeled auxiliary processors (AP) since they provide system-level support but are outside the APL system itself.

These APs function without any change in APL-SV or in the user's operation system, an Interprocess spokesman noted. File handling has always been one of the problem areas in APL, but these APs alleviate that problem, he claimed.

APL-SV users, can for example, employ Isam/AP, one of the Interprocess packages, to access standard Isam data sets or Vsam/AP to

access Vsam files, he said.

Finally, a File Management AP (AFM/AP) utilizes Vsam file techniques to emulate Scientific Time Sharing Corp.'s APL Plus File Subsystem, he added.

Currently installed with APL-SV and with VS/APL under IBM's Virtual Storage Personal Computing (VSPC) environment, AFM/AP will soon be released for VS/APL under the Conversational Monitor System (CMS) of IBM's Virtual Machine (VM/370) facility as well.

Isam/AP and Vsam/AP each cost \$5,000; the AFM/AP license fee is \$8,500.

Interprocess is at Suite 2410, 34 Peachtree St. N.W., Atlanta, Ga. 30303.

Software for Wholesaler, Distributor Uses Eclipse

MILWAUKEE — Software designed to support wholesalers, retailers, parts suppliers or distributors in controlling large data bases and thousands of transactions per day is now being offered by Doyle Data Systems for use on Data General Corp. Eclipse C/330 minicomputers.

The Distributor I package includes 85 CRT screen-processing programs prepared under DG's Interactive Data Entry and Access (Idea) software and more than 60 other programs, written in Cobol for batch processing. System files are organized under Infos, DG's data base management system, according to a spokesman.

Applications supported by the sys-

tem include order entry, invoicing, inventory control, back order control, purchasing, accounts payable, accounts receivable and general ledger, the spokesman reported.

The system has been tested using eight input terminals operating simultaneously; typical response times have been less than one second per transaction during order entry and invoicing, he claimed. At that rate, Distributor I can handle 20,000 transaction entries in an eight-hour shift, he noted.

Back orders receive special attention, the spokesman emphasized. They are created by the system during invoicing and the purchasing department receives reports showing which items are on back order. As shipments are received from suppliers, back orders that can be satisfied are released for shipment to customers.

The vendor also noted that the Distributor I package includes installation and maintenance utilities as well as the application logic. In addition, Doyle provides a one-week system training course and two weeks of on-site installation support.

The full Distributor I system costs \$27,500, but individual modules are to be purchased separately. A 50% discount on the software is granted to users acquiring the DG Eclipse hardware from Doyle, the spokesman said from 1701 W. Wisconsin Ave., Milwaukee, Wis. 53233.

Mini Manages Manufacturing

SAN LUIS OBISPO, Calif. — The Interactive Manufacturing Planning (IMP) package from Robert F. Williams Associates runs on minicomputers using Iris-type operating systems and provides a full time-phased, net change material requirements planning (MRP) facility, according to a spokesman.

IMP includes a bill-of-materials processor, inventory control and purchasing modules and other modules for creating and maintaining a master production schedule, shop loading, shop floor control, load smoothing, product/job cost analysis, work-in-process reporting and job status reporting, the firm said.

Financial management modules interfaced to IMP are also available, the spokesman added.

Turnkey Available

Iris is a time-sharing system for Data General Corp. Eclipse or Nova minis or other Nova-like CPUs. It supports multiple languages, multitasking, a four-level security system and data base management and is a product of Educational Data Systems, Inc. of Irvine, Calif.

IMP is available on a turnkey basis, including both hardware and software, and as a software package only. The turnkey systems range from \$45,100 to \$138,450; IMP by itself costs \$25,000.

Both Iris and the financial modules that can be linked to IMP are also available at additional cost from Williams at 626 Al-Hil Drive, San Luis Obispo, Calif. 93401.



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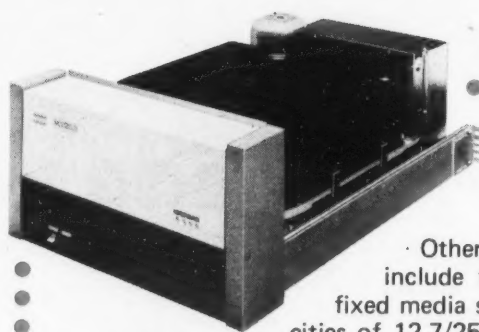
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Please, Read Between Lines in Ads for DBA

By Stephen L. Robinson

Special to CW

The ads are certainly enticing — high pay, prestige, responsibility. You have the requisite experience with the appropriate data base package and an impressive growth profile in data processing, leading to your present technical project managership.

Should you become a data base administrator (DBA)? Will the rewards adequately

compensate for the aggravation? Will you be able to handle the pressure? Let's explore the job by reading between the lines of recent advertisements for DBA positions.

It should be noted, before we start, that these examples from ads reflect the gamut of DBA environments;

Data Base Corner

i.e., one-person to 10-person (and up) DBA groups. In the former case, there is more emphasis on doing everything; in the latter case, the emphasis is on managing the people who are engaged in the doing.

Shortly after every data base package came on the marketplace, ads appeared for people with two years' experience. Now the absolute minimum seems to be three years, with some companies looking for a

minimum of five years.

Reasons for such stringent requirements (the absurdity of the time spans aside) do exist. The office of data base administration must perform two distinct sets of tasks relative to the data base package:

First, the DBA group should contain system programming expertise to maintain the package, do system generations design interfaces to special-purpose software, etc.

Some data base packages are sufficiently "clean" and so infrequently rereleased as to require only the part-time attention of one person. Other packages are known for their insatiable appetite for system programmers.

Second, the DBA group should design the physical (and, if appropriate to the package, logical as well) data base structures.

Many organizations are employing a data base package as an access method and are therefore allowing project managers to design their own file structure. In such environments, the DBA group should act as internal consultants to the individual projects.

Signal of Weakness

If the ad calls for experience with the XXX computer, YYY operating system and ZZZ report writer, beware.

In some organizations, where the existing system programming group is either weak or nonexistent, you, as the DBA, will end up having to manage the normal system programming activities.

The data base administrator is, of course, manager of the data base administration group, typically a group of prima donnas. Good data base designers and system programmers are as scarce as octal-based computers. And the designers and programmers know it.

Keeping such a staff happy can be quite a challenge. The alternative to acquiring really good people is making do with average or below average people and that is not easy. More managerial time is required to set deadline, monitor performance, adjust schedules, make excuses to higher management, etc.

Absolute Must

"Strong interpersonal skills are an asset." Asset, hell — they are an absolute must! DBAs are typically not very popular people. Worse, the people who like them the least are the very people they must get along with. For example, computer center managers often get quite disturbed at the massive incursion data base may make on their domains. Yet, clearly the DBA should

(Continued on Page 36)

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Openings for Systems Software Support

ADR knows that its products can only be as good as the service we give our customers. If you like dealing with people, enjoy an occasional trip, and have strong communication skills, you might consider a support position at ADR. To qualify, you should have a strong technical background in IBM computers and operating systems, and a college degree. As our product line continues to expand, our product support needs will grow as well. You could be a part of that growth!

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'Edit-Pak,' Hasp Support Enhance Datapoint Sites

WASHINGTON, D.C. — The Edit-Pak II source data library/data editing system and the Hasp/DS Interlink Hasp emulation package, for Datapoint distributed processing systems, are now available through Association Systems Co. (ASC).

The software was developed by and available from The Wyatt Co.

Edit-Pak II was designed to overcome "many of the problems associated with interactive editing" under Datapoint's Datashare environment, he said. Through its library facility, the independent editor provides up to 11,000 files of each logical drive — in contrast to the "normal" limit of 256, he added.

The use of a direct access approach lets the Edit-Pak II editor point to records in large files "considerably faster" than the command editor provided with Datapoint systems, the spokesman claimed. He also noted the editor supports global changes, multi-line deletes, block editing within both the target and external files and a data translate command.

Meanwhile, the Hasp/DS package was designed to allow all of the Datashare ports to build jobstreams

for transmission by the Hasp workstation emulator to a central site for processing. This eliminates manual intervention on the system console by each person desiring to send a message through Hasp, the spokesman explained.

If the Hasp emulator is busy or not active when a request for transmission is initiated, the request will be entered in a queue and acted upon as soon as the Hasp emulator becomes active or finishes its current transmission.

The Edit-Pak II package costs \$950 while the Hasp/DS Interlink software costs \$2,500. Either or both can be ordered from ASC, Suite 5, 1925 K St., N.W., Washington, D.C. 20006.

Philips Adds Software

WOODBURY, N.Y. — A payroll package and an indexed sequential access method (Isam) facility are available from Philips Business Systems, Inc. for use with its Visual 1 accounting systems.

The payroll package includes modules for salary and wage calculation, earnings and deduction registers, quarterly and annual state and federal reporting and check extraction, a spokesman said.

The pay calculation module lets the user define payroll frequencies as well as earning and deduction codes.

The check extraction module summarizes payroll transaction records and creates the interface to the check reconciliation module.

The File Creation and Maintenance (Fcram) utility is said to ease the development and updating of disk files by applying Isam techniques. Information on file fields and parameters are passed to Fcram, which then prompts the user interactively through a CRT.

The payroll system is available free to users just acquiring Visual 1 systems: As part of the turnkey system price, they are offered any two of several applications packages Philips has. Current installations can acquire the payroll package for \$1,200.

Fcram is free to all Visual 1 users, the spokesman added from 175 Froehlich Farm Blvd., Woodbury, N.Y. 11797.

HP 21MX Shops Gain File Help

VAN NUYS, Calif. — The keyed Sequential Access Method (Ksam) software from Theta Computer Systems was designed to allow users of Hewlett-Packard Co. 21MXs to create and maintain disk files whose records can be accessed by the value of a key field, by a relative number or sequentially.

Records may be written to a Ksam file in any order without regard for key value sequences, and they may be accessed sequentially, randomly by key or directly by the relative record number, which is posted to the record when it is created, a spokesman said.

The keys are maintained in a separate file that matches each key to the logical address of the data record. The key file is updated by the Ksam software as records are added to the data file, he said.

Keys may be as much as 31 words long and records may contain 2,047 words. There is a key-level lock to provide exclusive update of a data record, and Ksam files are compatible with HP's File Management Package.

Ksam automatically performs any key file reorganization required to accommodate newly added records to the associated data file. When records are deleted, the system returns the data record area to the file manager for reuse.

Ksam runs on any HP 21MX under the RTE environment. It is available on paper tape, mini-tape cartridge or magnetic tape for \$750 (plus 6% sales tax in California), the spokesman stated from 6919 Valjean Ave., Van Nuys, Calif. 91406.

Correction

The Record Extraction, Manipulation and Print (Remap) program from Pascack Data Services, Inc. [CW, Jan 30] was designed for use on Burroughs Corp. B700s, not B4700s.

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Taking DBA Ads at Face Value Can Mislead

(Continued from Page 32) endeavor to cultivate the relationship with the computer center manager, since poor allocation of computer resources to data base activities can result in disastrous performance of data base applications. In addition, project managers, as cited earlier, often resent the DBAs, since they have usurped responsibility for file design, and indeed, file processing. Again, a

poor working relationship here often results in project managers actively opposing the use of the data base package for their project.

If forced to use it, they will then proceed to blame the package for all problems associated with the application; the data administrator (DA) should be the friendliest of the DBA's interfaces. In a sense, the DBA is charged with acting as the DA's technical arm.

This sometimes means the DBA must squelch, on technical grounds, elaborate plans of the DA. This must be done diplomatically to ensure the maintenance of the crucial DBA-DA interface.

Extent of Experience

Ten years' DP experience may be a bit much, but certainly a DBA needs extensive knowledge of the total data processing environment.

In my next column, I will discuss some of the major areas of responsibility of a DBA:

- Data Entry procedures (including scrubbing and editing procedures).
- Terminal security.
- Batch security.
- Performance (data base and nondata base).
- Maintenance of software (data base package, teleprocessing package, data dic-

tionary, report writers, query facilities).

- Generation of file definitions.
- Development of standards (use and documentation).
- Backup/recovery.

Each of the above areas can in turn be subdivided (e.g., "performance" requires knowledge in such areas as operating system characteristics, disk performance as a function of such things as buffer size and quirks of various access methods).

Ulcer-Inducing

Data base administrator ranks as one of the more ulcer-inducing jobs in DP. It is primarily the technical aspects of the job that make it that way (e.g., strange error messages from the data base package during the execution of the payroll), although the diplomatic aspects of the job contribute to its high demands. On the other hand, aspects of the job (like structure design and security provisions) provide a good deal of the counterbalancing desirable (and fun) aspects of the job.

For those fence sitters who are still uncertain about whether or not to send their resumes out for a DBA job, I will devote several future columns to expansions of DBA tasks.

Robinson is an independent consultant, operating as S.L. Robinson & Associates in Morrisville, Pa.

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- Partially inverted file access method allowing access by subset list order, index order and element value, and sequential search
- Maintenance type utilities
- System Support from the OASIS development staff
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Before you make your final decision on a DBMS, contact us about OASIS. Further information on OASIS can be obtained from:

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For CRT Terminals

Incoterm Has Virtual Storage Software

By Ronald A. Frank
CW Staff

WELLESLEY HILLS, Mass. — Incoterm Corp. has upgraded its CRT terminal software with a virtual storage operating system that gives multiprogramming capabilities to existing and future users.

Called the Incoterm Transaction Edit Management System (Items), the software supports local editing, interactive and batch processing using a high-level macro language called Transaction Development Language (TDL).

Items software operates on the Incoterm Series 30 and Series 40 intelligent CRTs and is said to reduce the time required to develop distributed terminal applications. Types of transactions supported by Items include interactive data entry, local data entry with editing, local forms storage, remote batch, off-line operation, stand-alone functions and emulation.

Emulation for IBM 3270 and Honeywell

Information Systems, Inc. VIP 7700 protocol is available with Items. In the third quarter of 1978, support will be added for the Univac U-100 and Burroughs Corp. TD820 protocols, an Incoterm spokesman said.

Required Systems Configuration

A systems configuration required to operate Items software includes a Series 30 or Series 40 terminal processing unit with 64K bytes of core storage and up to 16K bytes of semiconductor memory for screen refresh functions. Eight standard Incoterm printer offerings can be supported. Storage includes 2M characters of diskette files and 40M bytes of rigid disk storage.

The application programs under Items are written by the user with TDL, which is described as a "Cobol-like" higher level language used to create software for transaction entry and editing functions. Using TDL, a program can interleave both interac-

tive and batch data entry operations, Incoterm said.

Series of TDL Statements

Application programs are written using a series of TDL statements with the TDL compiler. Where existing CRT screen formats are being retained, an off-line utility takes screen formats transmitted from the central site and translates them into TDL. This is said to simplify interfacing to existing terminal networks.

Because local storage is virtual, each programmer assumes availability of an entire 64K terminal memory. Since entered data is available locally, off-line programs can be written to produce management reports and perform other local functions "without taxing the CPU," the company said.

Smooth Addition Procedure

Items can be added to existing Incoterm CRT configurations without mainframe changes and without extensive conversion procedures, Incoterm said. The system can support up to eight terminals and printers and is said to reduce communication line costs through data compaction/expansion principles. Decreased line loading because of local intelligent features are said to lower communications costs and increase terminal response time.

Items software in object code format costs \$7,500 with maintenance and systems support available for \$2,400/year including software upgrades. The initial version of Items for 3270 emulation using binary synchronous communications is available in 60 days from Incoterm Corp. at 65 Walnut St., Wellesley Hills, Mass. 02181.

Interface 78 Expo Coming in March

LAS VEGAS — The Interface 78 data communications conference and exposition will be held here March 6-9.

The four-day conference will include about 70 sessions dealing with various aspects of data communications applications. An estimated 175 exhibitors are expected to display products and services of interest to network and distributed DP users.

Five sessions about communications-oriented software and seven sessions on the use of hardware will be featured. Other sessions will deal with packet-switching and network protocol issues.

Information about the conference is available from Datacomm Interface, Inc., 160 Speen St., Framingham, Mass. 01701.

IBM Adds Three CRT Stations For Use With Its System 34

ATLANTA — IBM has introduced three CRTs designed to reduce costs and increase capabilities for System 34 users. The additions include the 5252 and the 5251 models 1 and 2. The 5251 Model 2 replaces the comparable 5251 Model 12, the firm said, and the 5252 replaces the 5251 Model 11.

The models of the 5251 display station provide 970-character displays and offer similar capabilities to those previously announced for models 11 and 12 with 1,920-character screens.

The 5252 dual display station, which functions as two independent 960-character displays, provides "low-cost" multiple stations at a single location, according to IBM.

The 5252 allows separate jobs — such as order entry and accounts payable — to be executed concurrently, it said.

The dual station reportedly attaches to the System 34 system unit or the 5251 model 2 or 12 displays and can function as the system console when attached to the System 34 system unit.

The 5252's functions include field highlighting and data editing, IBM noted.

5251 Model 1

The 5251 Model 1 also attaches to the System 34 system unit or the IBM 5251 model 2 or 12 displays. When attached directly to the system unit, it can serve as the system console, the firm added.

Model 2 provides communications capabil-

ity with the System 34 via Systems Network Architecture/Synchronous Data Link Control and allows the attachment of up to eight additional workstations.

The 960-character displays are fully supported by the System 34 System Support Program, RPG-II and Utilities Program Product.

Display screen formats created for 960-character screens (12 lines or less) can be displayed on either 960- or 1,920-character screens.

Enhancements Available

System Support Program enhancements include the capability to spool data to all printers attached to the System 34, and the System Support Program allows the user to restrict access to individual data files or program libraries, IBM explained.

The 5252 can be leased for \$100/mo and purchased for \$3,740, compared with the previously announced 5251 Model 11 at \$85 and \$3,200.

The 5251 Model 1 can be leased for \$80/mo and purchased for \$3,010.

The 5251 Model 2 can be leased for \$135/mo and purchased for \$4,655, while the comparable 5251 Model 12 can be leased for \$140/mo and purchased for \$4,830.

Prices on all models include keyboards. The IBM 5252 and IBM 5251 models 1 and 2 will be available in January 1979, IBM said.

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COMMUNICATIONS

Insurer Sinks Its Teeth Into On-Line Processing

CHATTANOOGA, Tenn. — At Provident Life and Accident here, a terminal-based system processes a wide variety of group dental plans.

Using IBM 3270 display terminals connected to an IBM CPU, Provident's dental claim system is said to be five times faster than any manual procedure. The on-line feature has given Provident a competitive marketing edge by increasing the speed of claims handling and decreasing the costs of operations, the user said.

By January 1976, Provident had developed, tested and installed its Group On-Line Dental (Gold) system. And South Central Bell Telephone became the first user.

The Gold system runs on an IBM 370/168 linked to 17 IBM 3270 CRT

terminals in the dental claim unit. According to Bill Crumley, head of the Dental Claim Unit, the system performs on-line dental claim processing, eligibility checking, payment calculation and automatic printing of drafts and correspondence.

The system also produces patient tooth charts on CRT terminals, keeps track of each patient's claim history and calculates pretreatment estimates for predetermination of benefits.

Data Entry Function

Terminal operators in the dental unit enter patient data from employee claim forms into the system. A 3270 operator preparing to enter claim data is guided by instructions in a fill-in-the-blank mode on the terminal's display screen.

play screen.

Up to eight different screen displays are available for data entry, with an additional screen available for checking a patient's claim status. The screen displays have been structured so that for a routine claim, the operator can completely process and pay the claim by using only the first three screens, Crumley explained.

Completing a Claim

To complete a claim, the terminal operator presses a special command key. This command authorizes the payment of the claim and the printing of an explanation of benefits (EOB) for the employee. All payment drafts and EOBs are produced at night on an IBM 1403 printer and are ready for mailing

the next morning.

Transactions entered through the terminals create employee/patient master file records including name, address, all claim history and a complete tooth chart — a diagram of the patient's mouth, showing all dental work. Like any other master file information, the tooth chart is immediately available on the terminal display screen.

Pretreatment Estimates

A special feature of Gold is the pretreatment estimate for any employee contemplating expensive dental work. By filing a predetermination-of-benefits claim, the employee can find out in advance how much of the treatment will be covered.

Practicing dentists, acting as dental consultants for Provident, review the claims and determine the proper benefit amount. Provident advises both the employee and the dentist of the benefit amount by sending a pretreatment estimate to each of them.

In the meantime, the employee's pretreatment data is kept on-line. When the predetermination-of-benefits turnaround document comes in, the employee's draft can be authorized immediately.

60 Seconds to Pay

"The major advantage to the system," Crumley summarized, "is the speed with which we can expedite a claim for our policyholder and his employees. Our 3270 CRT operators can process and pay a routine claim in 60 seconds.

"The most difficult claim should take no more than five minutes. Our on-line computer system allows us to handle a far greater volume with fewer people."

Study Says SNA Catching On

SAN JOSE, Calif. — IBM's Systems Network Architecture (SNA) approach is catching on, according to a new study, *Thirty Years of SNA Experience: Costs vs. Benefits*, from SBS Publishing.

The report states there are over 400 SNA users, many of which decided to follow the SNA approach within the last six months.

Further, it says all users have underestimated their initial costs, memory requirements and the difficulty of getting Vtam installed. But despite these problems, users were found to be positive on the long-term rewards of SNA.

30 Man-Years' Experience

The report is based on the experience of companies that have combined experience with SNA in excess of 30 man-years. Forty SNA users were contacted for background, and 15 companies granted in-depth interviews.

The report is written for companies that are considering IBM's SNA approach and want to learn from the experience of other users and for those that have already embarked on SNA and want a reference for comparing their experiences, the publisher said.

The study is available for \$149 from SBS Publishing, Suite 230, 4320 Stevens Creek Blvd., San Jose, Calif. 95129.

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For Home Deliveries

Service Designed to Reduce Oil Dealers' Costs

By William Gaze

Special to CW

PRINCETON, N.J. — Truck drivers for close to 175 home heating oil retailers from Canada to South Carolina begin the working day with delivery schedules drawn from information input through high-speed CRT terminals. The on-line terminals provide real-time access to the DP equipment of Petroleum Data Corp., a service facility based here.

Petroleum Data's computers are designed to cut dealers' costs by increasing average drop size, reducing the number of deliveries and automating invoicing, accounts receivable, burner service scheduling and other accounting procedures.

The Petroleum Data system lets dealers accurately determine which customers need delivery and when, based on degree day readings and customers' consumption history.

A weather monitor unit at each fuel oil dealer's location provides accurate information on local weather conditions, including wind chill factors.

Use of accurate fuel consumption data allows dealers to increase the average number of gallons delivered per stop and reduce the number of deliveries by as much as 35%. This is a significant savings since Petroleum Data estimates that each customer delivery costs a dealer an average of \$7 to \$8, not including paperwork.

The firm also estimates that many dealers servicing heating systems operate at a deficit because they use a manual accounting system. Petroleum Data offers a burner service scheduling system that utilizes the on-line terminals to help solve this problem.

Improved Cash Flow

The on-line terminal system also helps improve cash flow of dealers by allowing same-day billing. After a driver has completed his deliveries, he brings his delivery slips to the terminal operator. The operator then calls up a standard display screen format and enters the daily delivery data. The grade of oil and number of gallons delivered to each customer are specified, and price calculations are automatically made by the remote Petroleum Data computers. Bills and invoices can be generated by printers at each dealership.

The effect of same-day billing on a dealer's accounts receivable is significant, with Petroleum Data customers reporting reductions in accounts receivable as high as \$400,000 since installing the on-line terminal system.

Several on-line financial accounting programs can also be accessed via dealer terminals. Dealers can maintain general ledgers with the terminals. Reports can be generated with profit and loss broken down by product line, customers or departments.

An accounts payable program is also available, allowing dealers to efficiently schedule invoices for payment, generate cash requirement forecasts and take full advantage of prompt-payment discounts.

Finally, a fixed asset program lets dealers automatically compute tax credits and depreciation.

At the firm, two IBM 360/65 CPUs process energy consumption data for

approximately 750,000 U.S. and Canadian households. Over 200,000 dealer inquiries are made and over 400,000 output messages are generated at the central site during the system's 16 hours of daily on-line operation.

Each 360/65 contains 1M byte of core memory and there are over three billion characters of on-line disk storage. For security, all data from disk is transcribed onto two magnetic tape units. One is put into a tape library and the other is stored in an off-site bank vault.

Net Covers 12,000 Miles

Petroleum Data supports its network of dealer terminals with a communica-

tions system that extends over 12,000 miles. This system includes 40 full-duplex multidrop circuits extending east to Canada's Maritime Provinces, west to Detroit and south to Rock Hill, S.C.

The network operates at speeds of 2,400-, 4,800- and 9,600 bit/sec, with operating speed dependent on customer application and operating needs.

Modems used in the system include Racal-Milgo, Inc. 2,400 and 4,800-bit/sec units and several 9,600 bit/sec modems from Paradyne Corp. Two front-end units at the central site control traffic and terminal operation.

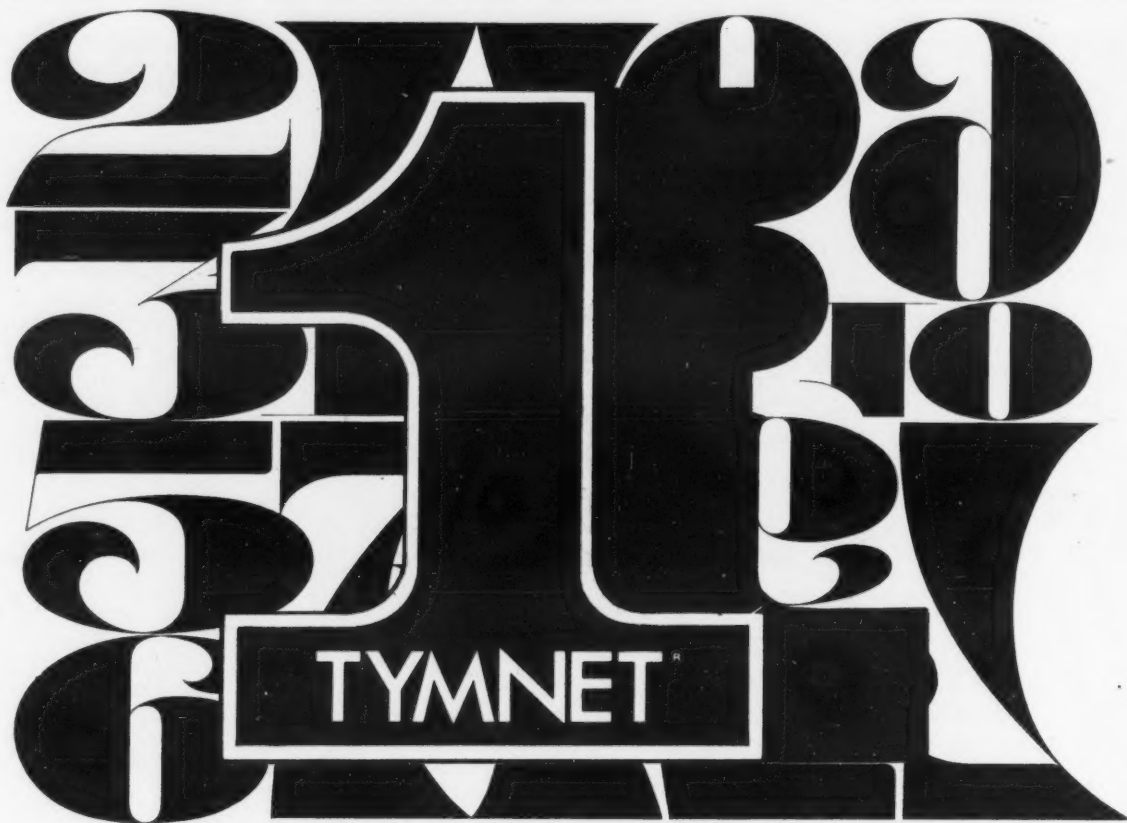
Lines and equipment are continuously monitored by digital and

analog test equipment including a Spectron Corp. Datascope. Through the use of EIA and VF patching facilities, backup lines and equipment can immediately be placed into service should the need arise.

Racal-Milgo System 400 Model 4 video display terminals, Harris Corp. terminals and Executerm 265 terminals from Courier Terminal Systems, Inc. are supplied to fuel oil dealers by Petroleum Data for remote data entry and retrieval.

Originally, Petroleum Data did not have any problem supplying its customers with Courier 265 terminals, and the company's software was de-

(Continued on Page 40)



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Test Line Grows

PROVIDENCE, R.I. — International Data Sciences, Inc. (IDS) has expanded its 8900 series of Minitest product line with a remote control panel that reportedly accommodates 16 channels of A,B switching when used with the company's Model 8962 controller and power module.

The Model 8931's master A,B control allows remote bulk switching of all 16 channels simultaneously to A or B, IDS added. LEDs indicate at both the master and remote site the status of each channel.

With a built-in power supply, the modular 8931 reportedly is expandable in 16-channel increments.

The Model 8931 costs \$1,600, the firm said from 100 Nashua St., Providence, R.I. 02904.

Three Elements to Unit RCA Develops Optics Data Link

SOMERVILLE, N.J. — RCA has developed a fiber optics data link designed for use in digital data transmission links and other applications.

Optical communications using fiber optics enables the transmission of light waves from one point to another through lightweight, flexible cables consisting of ultrathin strands or fibers of glass or plastic.

Optical fibers promise to supplement both wires and radio waves for communications in many cases, RCA said. Systems employing this technique have the advantages of being able to carry vast amounts of information, require low power, are not subject to static interference and are extremely

difficult to tap, a spokesman added.

The system consists of a transmitter containing an RCA gallium-aluminum-arsenide, LED and a receiver equipped with an RCA silicon photodiode. These two units may be connected to fiber optics cables made by the DuPont Co. or other fiber optics cable suppliers.

The transmitter and receiver are housed in compact modules which each measure approximately 2 in. square by 1 in. thick.

The RCA fiber optics data link, Model C86003E, including the transmitter, receiver and connector, is priced at \$850. Fiber optics cable is available at an additional cost, depending on ca-

ble length.

Details are available from the RCA Solid-State Division, Somerville, N.J. 08876.

Service Eases Dealers' Costs

(Continued from Page 39)

signed for them. When Courier stopped making the Executerm 256 terminals, however, Petroleum Data had to decide whether to buy used Courier terminals whenever new customers were put on-line or to find a new terminal supplier. The firm chose the latter option.

Presently, there are 53 of the Racal-Milgo System 400 stations with about 40 of the company's customers. The System 400 is plug and software compatible with the Courier 265 and is able to operate without any system changes. Use of the System 400 enabled Petroleum Data to add new terminals to its system without making any costly software changes.

An array of built-in diagnostics was one reason Petroleum Data felt the System 400 was a desirable substitute for the Courier 265. This is especially important, as the dealers can't afford to be without information and most of them do not have the technical background to troubleshoot their own equipment.

Diagnostics allow dealers with a problem to give an accurate report by phone to service engineers and, if the problem cannot be taken care of that way, greatly simplify the task of the Racal-Milgo field engineer who is sent out to make the repairs.

The System 400 terminal's line monitor feature displays all CPU- and terminal-generated data, including text and protocol characters.

Received data is underlined and parity errors, if detected, are shown in reverse video.

The line monitor feature lets a field engineer determine if line or terminal problems are involved and calls attention to parity errors that might otherwise go unnoticed.

Additional self-diagnostic features are visual checks of programmable read-only memories (Proms), random-access memories (RAMs) and terminal strapping. The System 400 terminals can also generate a test pattern that allows users with printers to check their accuracy against a data pattern on the video screen.

William Gaze is supervisor of on-line operations for Petroleum Data Corp. in Princeton, N.J.

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'Usually a C.P.A. is All That's Needed for a Tax Audit.'

Atlantic Research Unwraps On-Line Monitor

ALEXANDRIA, Va. — Atlantic Research Corp. has added the Interview II stand-alone monitor to its family of data communications diagnostic test equipment.

Interview II is an on-line monitor that helps identify

problems in both hardware and software by displaying data being sent and received over the communications line. The unit not only finds trouble quickly, but helps spot trends and potential problems before the system fails.

The system displays data in text, hex or octal; six different languages are standard. System errors and malfunctions are identified on a 9-in., 1,024-character display.

The test unit displays two independent pages of 512 characters in full or half-screen for later comparison. Send and receive data are highlighted. Trap and freeze features eliminate the need for bulk storage in most applications, the firm said.

Key features of the Interview II monitor include the ability to connect directly to the RS-232/V.24 interface and compatibility with SDLC,

ADCCP, HDLC, DDCMP, X.25, Snap, synchronous, asynchronous, full- and half-duplex protocols.

The system displays Ascii, Ebcidic, BCD, Selectric, hex or octal.

The Interview II stand-alone monitor is available in either portable or rack-mounted configuration and costs \$4,500 from Atlantic Research Corp., 5390 Cherokee Ave., Alexandria, Va. 22314.

Racal-Milgo Introduces Modem for Short Hauls

MIAMI — Racal-Milgo, Inc. has announced the Com-Link III short-haul modems.

The modem reportedly operates at strap-selectable synchronous data rates from 2,400 bit/sec to 19.2 kbit/sec over 19- to 26-gauge wire circuits up to 25 miles long. Earlier Com-Link modems operated up to a limit of approximately 10 miles.

Reliable operation over longer distances is made possible by two features: automatic adaptive equalization and the use of delay modulation. An automatic adaptive equalizer compensates for variances in circuit amplitude, providing initial line equalization in less than 2 msec, Racal-Milgo said.

Delay Modulation

Use of delay modulation facilitates transmission by allowing operation in a narrower bandwidth at higher power. Error rates for Com-Link III are better than one in 100,000 bits, the firm claimed.

The Com-Link III modems are designed for use in point-to-point and multipoint data communications systems in which many terminals are installed to close to a CPU. It would typically be used to support data links between local administrative, warehouse, manufacturing and distribution facilities.

Circuit Sharing

When used in conjunction with a multiport modem, Com-Link III allows local terminals up to several miles apart to economically share a common long-haul circuit, Racal-Milgo said.

Com-Link III also has an expanded test capability. A remote test feature lets an operator at either end of a point-to-point line place the remote Com-Link III into a digital loopback mode for fault isolation and testing without involving an operator at the remote site.

Com-Link III costs \$975 or

\$39/mo on a 30-month lease from Racal-Milgo, Inc., 8600 N.W. 41st St., Miami, Fla. 33166.

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Coupler Has Dual Speeds

PHOENIX — Omnitech Data Corp. is offering a dual 300- and 1,200 bit/sec acoustic coupler for use with remote data entry and retrieval systems.

The Model 103/202 allows a terminal to be used with a single acoustic coupler at data rates of 110-, 150-, 300-, 600- and 1,200 bit/sec, a spokesman said, adding Bell 103 and 202 protocol is accessible via an external switch. A Bell-compatible 5 bit/sec reverse channel is standard with the unit; a 150 bit/sec FSK is optional.

The Model 103/202 is field-programmable for both data and logic disciplines through internal, program switches. The standard RS-232C interface is provided.

The unit costs \$1,698 from Omnitech at 2405 S. 20th St., Phoenix, Ariz. 85034.

Sycor Adds Software Features For Model 350 Terminal System

ANN ARBOR, Mich. — Sycor, Inc. has introduced software enhancements to its Model 350 intelligent, stand-alone terminal system designed to expand its compatibility with distributed data entry and processing applications.

The Model 350 software is designated Level F and includes an enhanced version of

Sycor's own TAL II data entry programming language, IBM 3741 communications emulation, disk file continuation support and a report generator.

The Level F enhancements, provide Model 350 terminal system users with a software package for increased speed of execution, reduced memory requirements for user pro-

grams, data communications flexibility and ease of business reporting, a spokesman claimed.

An enhanced version of Sycor's TAL II on the Model 350 is said to improve the speed of executing arithmetic functions. It also reduces the amount of memory required to run a typical TAL program, thereby allowing larger user programs, the firm said.

IBM 3741 emulation on the Model 350 is an addition to Sycor's communications facilities and allows the terminal system to communicate with IBM 3741, 3747 or mainframe hardware.

The file continuation concept, previously supported only by communications programs on the Model 350, has been expanded and can now be supported by TAL II language and utility programs. This facilitates the processing of larger remote data files using all of Sycor's support software, the spokesman said.

Report Generator on the 350 system provides users with the facility for easy generation of business reports in processing data. Sycor's Report Generator "closely resembles" and provides many of the features of the RPG-II language, according to the vendor.

All four Level F enhancements will be available in April. The complete Level F release will be supplied on three diskette libraries, each priced at \$35.

When purchased in combination with one or both of the other diskettes, they are priced at \$25 each, the spokesman noted from 100 Phoenix Drive, Ann Arbor, Mich. 48104.

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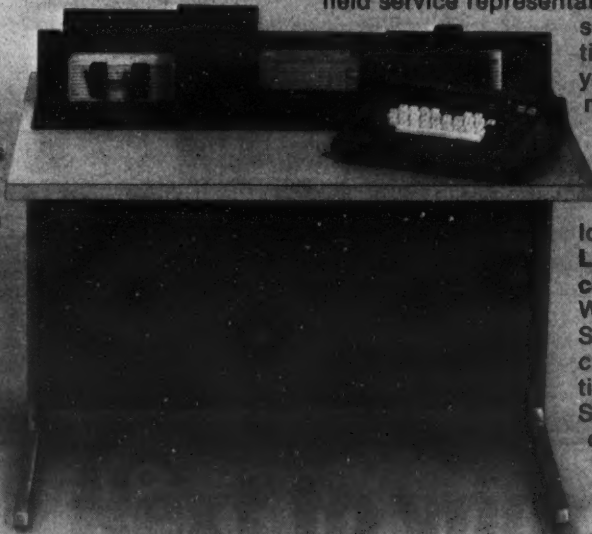
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In Data Entry Design

Function, Comfort Both Seen Important

By Frank Vaughan
CW Staff

LOS ANGELES — Users looking for cosmetic design features in data entry equipment may not always get what they want. However, most vendors are aware of the importance of these nonfunctional niceties.

"There are features, and there are features," John F.G. Leighton noted in a recent interview here. The human comfort factor in data entry equipment is just as important as people say, but it is just that some factors are more important than others, the product manager for the Data Systems Operations Division of Pertec Computer Corp. observed.

"In the case of a purely convenience item, such as a drawer in which the operator can store personal belongings, it is not very important, because the operator will not use that drawer very often. If it is a feature that is being used every half hour, or every minute, or every second, then it gets very important," he suggested.

Vendors have discovered that there are people who adapt to all sorts of strange sitting postures. Some have been observed keying data while sitting in a chair cross-legged with their feet tucked under them and a keyboard in their lap.

"The evolution of human engineering and the design of these things has come to where we now make independently movable keyboards and CRTs so that if somebody likes to sit in some really strange position, he can put the keyboard in his lap and turn the CRT so that he can see it," Leighton noted, adding that left-handed people can even put the keyboard sideways if they wish.

"We can divide features into two categories, the first being features that make it easier in a technical sense for an operator to achieve accuracy or to increase output. Then there are the sheer-comfort convenience or identity items for the operator who feels 'I have to live in this space for eight hours — what is it going to do to me?'" he noted.

"In a way," Leighton explained, "these features are intertwined. Some of them are physical and some of them are psychological." The modesty panel is a good example, he said.

Modesty panels are placed across the rear of a work location and their height has tended to vary over the years in an inverse ratio with the lengths of skirts, he said. These panels are designed so that operators can sit any way they want, but if a person has very long legs, the modesty panel can get in the way, he observed.

Pertec has tried to avoid becoming involved with such furniture design problems. "Following the lead of IBM, we have taken

the position that furniture, generally, is a business that other guys do better. The user has better sources than us for furniture or complete data entry workstations," he said.

Besides, he suggested, the functional design area provides enough potential headaches.

Data Entry Dimensions

"All of us have very elaborate methods of testing the quality of the data that the operator is keying. What supervisors need to know is 'is this stuff right?'" he pointed out.

"So the next question is 'how should the operator be alerted when something is wrong?' There are all sorts of schools of thought on what you should do about it. In most cases, getting the right answer, doing what is best for the operator, is super important because it affects the accuracy of the data. It is quality control," he said.

Leighton noted that something as simple as

a lamp's location, whether there should even be a lamp or whether there should be an audible alarm can become major considerations. As an example, he pointed out that if there is an audible alarm, the operator should not depend on it exclusively. "Whatever the audible scheme is, we have to make sure that it does not handicap the deaf person," he stressed.

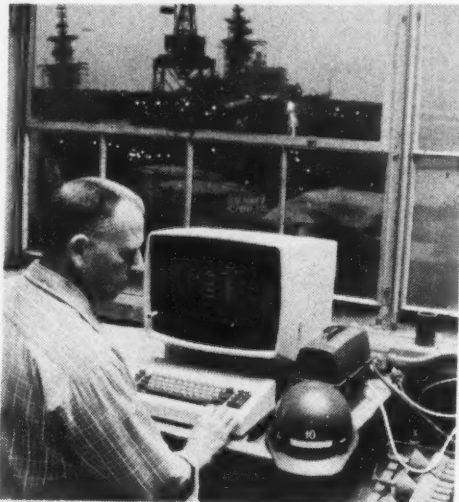
Other questions that come up include whether or not the operator should have control of the volume of such a device.

"These questions almost have to be answered in the product development stages, because once the equipment gets designed, it gets tough to change," he added.

Industrial designers discovered years ago that if people aren't comfortable with the design or feel of an item, it won't sell, no matter how it performs its function. Appearance makes things marketable, and lack of it makes it hard to sell," Leighton asserted, noting that if users aren't willing to pay for nonfunctional features, vendors are not going to be too anxious to add them gratis, because generally, if a user is not willing to pay for an option, it is not too important to him.

Shipbuilding Costs Trimmed With Material Control System

BATH, Maine — Bath Iron Works (BIW) is using a medium-scale mainframe to help manage the flow of material used for shipbuilding, resulting in faster and less costly construction.



A system based on a medium-scale mainframe is in use at the Bath Iron Works to keep track of shipbuilding material.

The Material Control System helps manage the shipbuilding process from initial design to the purchase of parts to the use of those parts by production tradesmen. Using CRTs linked to a central IBM CPU, shipyard workers can instantly retrieve up-to-date information about the availability of material to meet work requirements.

"We believe our Material Control System is in many respects the most modern in the world," James Greenlaw, BIW director of systems, said. "We have had representatives of other shipyards come in to look at our system because they recognize it has certain unique features and is perhaps the most effective system in the industry."

"The IBM 370/145 helps us readily identify surplus or shortages among the 40,000 inventory items that are required to satisfy 300,000 individual material requirements," he said. BIW's system is configured with 750K bytes of memory and 24 IBM 3277 CRTs.

The system is capable of controlling inventory for the simultaneous construction of Navy and commercial ships, in addition to repair and modernization work in the

(Continued on Page 52)

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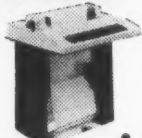
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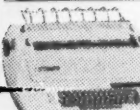
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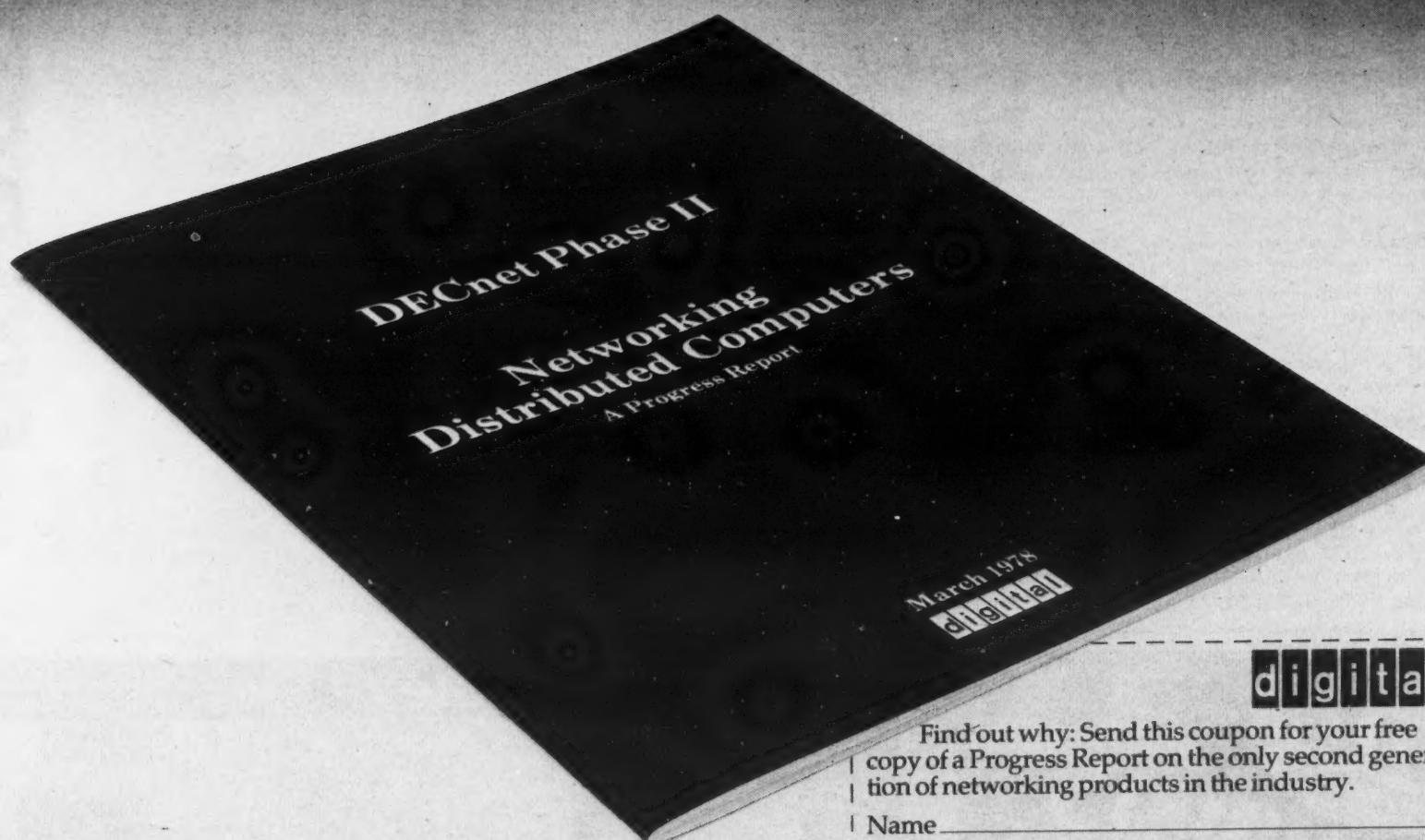
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CW2278

John Deere Saves \$30,000/Year in Rental Fees

DES MOINES, Iowa — John Deere's farm equipment plant here has harvested nearly \$30,000 in annual hardware rental savings with the installation of a multifunction data entry and remote job processing system.

The firm credited its latest system with reducing communications costs as well as the amount of operator intervention required for data handling. At the same time, according to Roger Schenke, DP manager for the Des Moines plant, the data entry system gives the company increased accuracy and improved data control.

The Des Moines Works, which produces the John Deere cotton picker and 17 other farm products, has had the problems of a normal manufacturing operation, according to Schenke. His department is responsible for all data — including accounts payable and receivable, payroll and production reporting — traditionally found in centralized keypunch sections.

The department had used IBM 129 keypunch and verify machines to enter data — most of which comes from source documents as invoices, warranties and payroll cards — but later switched to dual-station, flexible disk IBM 3742s to reduce card costs and machine rentals. Some increase in operator productivity was realized.

To transmit data to the host IBM 370/168 CPU at corporate headquarters in Moline, Ill., the company used an IBM Model 20 and a Model 2922 card transmission. The IBM 3741 was used to transmit diskettes.

Since the company continued to retain some keypunch devices, control of the constant mixing of card and flexible disk data between the data entry department and the computer operations department became increasingly difficult.

With the 3740 system, there was also time-consuming computer operator intervention involved in changing the diskettes during data transmission, Schenke said. Because the 3742 had no communications capabilities, he added, someone would have to walk the diskettes to the computer operations department to have the data transmitted and processed.

To ease some of the communications problems, the company selected a Data 100 Corp. Model 78 remote job processing system which could transmit information at speeds up to 19.2 kbit/sec. With its two 1,000 line/min printers, 1,600 bit/in. magnetic tape drive, 1,000 card/min card reader and 150 card/min punch, the system could handle a variety of media and, at the same time, save several thousand dollars in annual hardware retail over the IBM devices.

To combine the power of the Model 78 with a more flexible data entry system, the company opted for a Model 74 Keybatch system with 11 CRT stations and 10 million characters of disk storage.

The system has helped reduce data entry errors to less than 1%, Schenke noted. Through a series of staff-written procedures, the system edits and checks the data to ensure it is correct before it goes to the CPU.

The system performs a range of pre-programming functions including range checking to make sure that a customer shipment is less than "X" days from receipt of the order; field

checks to guarantee that certain fields, such as customer name and address, are always entered; and table lookups to allow operators to enter a single

Data Entry Dimensions

character such as "P" to denote a pallet for shipments, rather than have to key in the entire word, according to Mike Peters, computer services supervisor.

When an "out of range" condition does occur, the system automatically stops and displays the error for the operator, he added.

The company has been able to reduce

the total number of keystrokes by employing the duplication feature. It is using this feature not only to duplicate common fields in records, but to generate constant data such as the current date and record codes in all records.

Formatting Capability

Besides the intelligent functions that the system performs, the company has also benefitted from the system's formatting capability. The company now utilizes about 250 different input formats — with up to 99 format levels on each "job in" — about half the number available on the previously used data entry machines, Schenke recalled.

With the IBM equipment, operators could modify the data entry process by

creating their own programs. The problem, according to Peters, was that each operator used a slightly different style, so that each program was in a slightly different format. When it came to training a new operator, it was a case of one operator learning another's idiosyncrasies.

To develop more universal programs, the company designed programs that used the most common and expedient elements of each operator's procedures, in one case reducing the number of formats in a job from 56 to 16.

While Peters admitted the operators were apprehensive at first, he believes their overall performance, as judged by the system's statistical program feature, has improved.

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With 'Slightly Greater Risk' User Opts for 'Superior' Price/Performance

By Tim Scannell
CW Staff

MAYFIELD VILLAGE, Ohio — In choosing an Intel Corp. AS/4 CPU over an IBM 370/148, "we were willing to accept a slightly greater risk in exchange for a far superior price/performance," Lee Herrington, DP vice-president for the Progressive Corp., explained. "We got past the concern that without IBM we would be cast adrift."

According to Herrington, IBM's marketing people failed to recognize Intel as a "meaningful competitor" and hesitated to compare their processor on a point-to-point basis. They "knew very little about the Intel machinery and

didn't really deem it a serious threat," Herrington said. They actually "failed to recognize [Intel's] existence."

Several months ago, the Progressive Corp., a holding company whose principal operating subsidiary is the Progressive Casualty Insurance Co., decided to upgrade its operating system from a DOS to a DOS/VS environment, a spokesman said. The firm purchased an Intel add-on memory which, when attached to its IBM 370/135, increased memory from 144K to 384K bytes.

Progressive deals mostly with high-risk insurance policies that cover such things as automobiles, motorcycles, mobile homes and various recreational

vehicles, a spokesman said.

Because of a marked increase in business since the additional memory was implemented, it was decided to obtain a new CPU with greater capabilities, the spokesman continued. However, instead of upgrading to the 370/148, Progressive chose an Intel CPU.

"We had favorable experiences with the Intel memory and its disk drives," Herrington said. This made Progressive receptive to Intel's marketing strategies, "enough at least to listen to what they had to say."

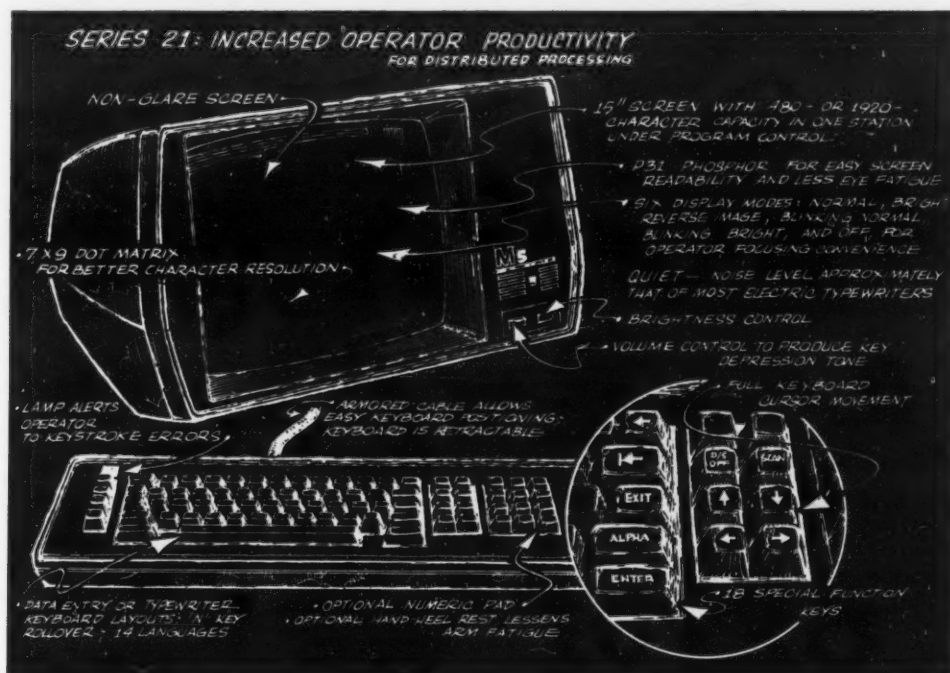
Despite probing, IBM never really answered the firm's questions, Herrington said. When asked, the IBM people said they knew very little about

the Intel machine and were not inclined to talk about a competitor, Herrington said.

"They couldn't give me any meaningful information, such as who had the superior architecture or speed, either," he added.

IBM continually stressed the added values of doing business with IBM because of its support and service capabilities, he continued. "They very rarely will take you through a point-by-point comparison with a competitor," he noted. "IBM is of an older chip technology and I suppose it's understandable why it would be rather closed-mouth about discussing which machine is better."

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'Extremely Responsive'

Intel, on the other hand, "was extremely responsive in digging up answers and documentation," Herrington claimed. "I raised question after question and Intel... did everything it could to educate me so I could make an intelligent decision."

IBM did finally concede that "Intel's machine was of a newer technology, that it was in fact faster and cheaper, runs cooler, has less parts and uses less electricity," Herrington said.

The equipment in the DP department at Progressive includes six Intel disk drives with a capacity of 100M bytes, six Storage Technology Corp. Model 3450 1,600 bit/in. tape drives, two IBM 1403 printers and a Decision Data Computer Corp. Model 6615 1,500 lin/min. printer manufactured by the Data Products Corp.

The Intel CPU was selected in large part because it was plug-compatible with the current peripherals. "We had no interest in changing our software or rewriting out programs or anything like that," Herrington stated. "Another advantage is that the system can be upgraded in the field," without having to replace the entire CPU or undergo a major overhaul.

Besides IBM and Intel machines, the firm looked at a Control Data Corp. Omega system, but "it didn't seem to be a viable entity in the marketplace at the time. The marketing people contacted us but never mentioned if they had a CPU available," Herrington remarked.

There were a few problems with defective chips when the CPU was first installed, but they were anticipated, Herrington stated. "I had surveyed other users and discovered that in the process of 'shaking down' a system there seemed inevitably to be a chip or two that would fail." He indicated, however, that Intel technicians promptly repaired any machine failures.



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For IBM 370, System 3

Memorex Unveils Disk Drives, Controllers

SANTA CLARA, Calif. — Memorex Corp. has expanded its 3640 family of disk storage drives and controllers for IBM 370 and System 3 computers with the introduction of the firm's 3644 disk drive module.

The Memorex 3644 is a dual-spindle module with 280M bytes per spindle when used with the 370 CPUs and 203M bytes per spindle when used

with the Sytem 3 CPUs, according to a spokesman. The module's data transfer rate is 885,000 byte/sec with an average access time of 25 msec.

Each of the 3644 drives incorporates a resident head-disk assembly (HDA) that combines disks, access arms, read/write heads, spindle and voice coil bobbin. The 3644

HDA is similar to the type used in Memorex's 3650 line of 317.5M-byte drives.

The 3644 modules are designed for use with the IBM 370 models 115-2, 125-2, 135, 135-3 and 138, as well as the 3/15D, a spokesman claimed. Attachment of the 3644s is made through the Memorex 3643 disk drive module and controller to the IBM 370's

Direct Disk Attach (DDA) or Integrated File Adapter (IFA) and to the 3's Disk Storage Attachment feature.

Standard IBM software is utilized for attachment to systems with DOS/VS, OS/VS1, OS/VS2 and VM/370. Features that are standard on the 3644 in a 370 environment include rotational position sensing and read-only switch.

The 3644 sells for \$42,075, or \$1,000/mo on a two-year plan, including maintenance. First shipments will begin in July from the firm at San Tomas at Central Expressway, Santa Clara, Calif. 95052.

Firm Plans To Ensure Power Level

PETERBOROUGH, England — Emergency power systems for computer complexes have to be totally reliable, because even a break in power lasting 1 msec can cause untold damage and the loss of vital and sometimes irreplaceable information.

At the headquarters of Perkins Engines Ltd. here, power to the firm's recently installed IBM 370/158 is guaranteed through the use of a 220-volt nickel cadmium alkaline battery that will immediately take on the full load while an emergency shutdown sequence is carried out, preventing any damage or loss of information, a spokesman said.

The battery, supplied by Chloride Alcad (Chloride Systems, Inc. in the U.S.) is made up of 186 Alcad-type DLP21 plastic cased cells with a capacity of 210 amp/hr.

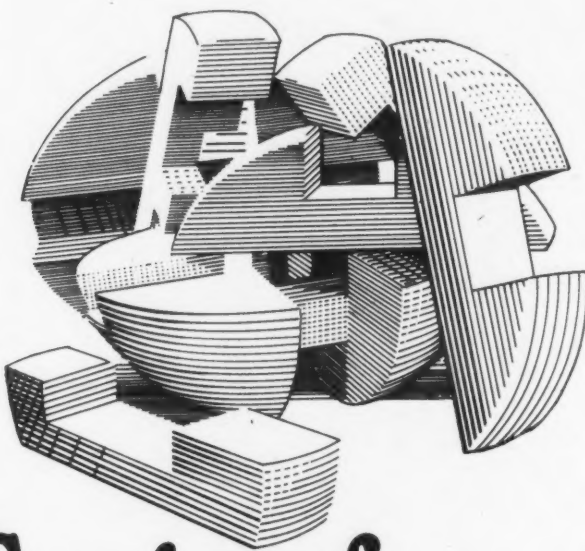
'Totally Reliable'

"We obviously needed a battery that would be totally reliable, but which would also meet the performance criteria we required. Although more expensive initially, an Alcad battery was best suited to this particular application, according to Philip Harrison, project engineer at Perkins' Civil Design Department.

Requiring only minimal maintenance over a long life cycle of some 20 years or more, Alcad batteries have the ability to recharge very quickly. This normally enables them to perform their emergency duties again within hours of a power failure.

At the Perkins computer center, the battery is floated in a no-break mode within an inverter system supplied by Franklin Electric Programmed Power, Inc.

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Interface Links CDC Printers, Decsystem-20

LONG BEACH, Calif. — The Printer Sales Co. is now offering the Control Data Corp. band printers for sale to end

users of Digital Equipment Corp. Decsystem-20 general-purpose computer systems.

Printer Sales has its own

controller/interface for operating the CDC printer with the Decsystem-20. The interface consists of three plug-in circuit boards that "are retrofitted" to the Decsystem-20 electronics, the firm said.

The CDC printers are available with printing speeds of 300-, 600- or 900 line/min with a standard 64-character set. Optional 48-, 96- or 128-character sets with corresponding increases and de-

creases in printing speeds can be selected through changeable print bands.

The 300- and 600 line/min printers also offer an option of 15 char./in. density instead of the normal 10 char./in. a spokesman claimed, noting this increased density permits 132-character-wide printing to be accomplished on 11-in.-wide paper.

The printers cost \$6,390 to \$14,900 for the 300 line/min

model, \$8,315 to \$19,900 for the 600 line/min model and \$11,595 to \$25,900 for the 900 line/min model. Full payout leasing is also available.

Prices range from a "do-it-yourself" kit that does not include the controller interface, installation and some features to a complete system, including installation.

Printer Sales Corp. is at 2684 Dawson Ave., Long Beach, Calif. 90806.

Printer Uses Plain Paper

WATERTOWN, Mass. — A microprocessor-based printer that handles plain 8.5-in. paper and is RS-232C-compatible has been introduced by Integral Data Systems, Inc.

The IP-125 impact printer features an RS-232C serial interface, parallel TTL-level interface and full upper and lower case Ascii character set of 96 characters as standard equipment.

Capable of printing multiple copies on ordinary 8.5-in. roll, fanfold or sheet paper, the micro-controlled IP-125 incorporates a 256-character multiline buffer to achieve a print rate of up to 100 char./sec with a sustained throughput of 50 char./sec at 80 column/line, a spokesman claimed.

Few Moving Parts

The printer has few moving parts and features a reinking ribbon, he added.

Serial rates of 110 to 1,200

OCR Users Plan Summer Meeting

HACKENSACK, N.J. — The OCR Users Association has announced that its summer meeting will be held at the Hershey [Penn.] Motor Lodge and Convention Center July 30 through Aug. 2.

'Matured Technology'

The theme is "OCR — A Matured Technology and its Impact on Future Applications." Principal speakers will include Herb Grosch, president of the Association for Computing Machinery; Ken Hull, president of the National Association for State Information Systems; and Vico Henriques, president of the Computer and Business Equipment Manufacturers Association.

Additional information on the conference may be obtained from the association at 10 Banta Place, Hackensack, N.J. 07601.

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If you're doing on-line applications, then the Xerox 1760 is your lucky number. The new 1760 has an impact

matrix printer, which gives you both upper and lower case, rapid quality printing, and automatic bi-directional printing. The ASCII Coding lets you connect to almost any hardware and software system around. And if speed is the name of your game, the 1760 prints up to 200 cps.

For more information call Pete Hegerle, Xerox Data Systems Division, (213) 679-4511, or write him at 701 S. Aviation, El Segundo, CA 90245.

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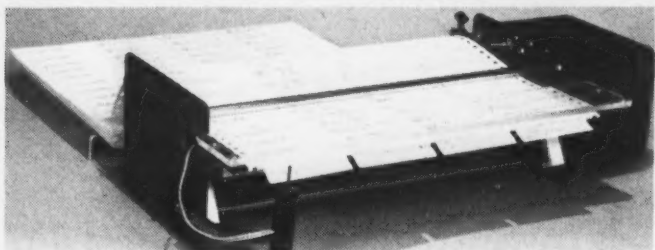
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Dispensamatic 16

Dispenser Eases Mailings

ST. LOUIS — Commercial Mailing Accessories, Inc. has unveiled a product that aids in the handling of computer-produced, pressure-sensitive labels.

The Dispensamatic 16 operates by peeling the carrier paper away and presenting a row of labels to the operator.

Labels are removed manually, from right to left.

The unit is capable of dispensing one-up as well as any multiple columnar printout format, according to a spokesman.

The dispenser sells for \$425 from the firm at 1335 Delmar Blvd., St. Louis, Mo. 63103.

From Computer Enhancement

RAM Upgrades NCR Century 101

COSTA MESA, Calif. — A random-access memory (RAM) system designed to upgrade the NCR Corp. Century 101 computer to a level comparable with a Century 151 was announced by the Computer Enhancement Corp.

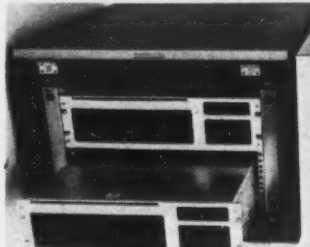
The RAM-Stor 101/151 memory system expands the memory capacity of the Century 101 to 256K bytes and increases memory speed to a 750 nsec cycle time, according to a spokesman.

With the memory enhance-

ment, instruction times for addition of unsigned, unpacked five-digit computations, for instance, have been cut from 28.8 msec to 18 msec, the firm claimed.

Similar improvements have been made for multiplication, division and most I/O bandwidths, the spokesman added.

The memory capacity is said to be fully compatible with NCR software and is available at a cost of \$45,000 for 128K bytes. Computer Enhance-



RAM-Stor 101/151

ment Corp. is at 3189-E Airway Ave., Costa Mesa, Calif. 92626.

Units Hold Documentation

WORCESTER, Mass. — Two products, both designed to aid in the filing and reference of DP documentation, manuals and program listings,

are available from Wright Line, Inc.

The Documate Desk Rack features a hanger bar assembly for center hook filing of manuals and is equipped with rubber feet to prevent marring of desk tops.

The Documate Pivot Desk Rack is similar to the above, but includes a cartridge assembly that allows reference material to pivot upward.

The Desk Rack Model 2855-71, and the Pivot Rack, Model 2950-22, are priced at \$30 and \$22.50, respectively, from the firm at 160 Gold Star Blvd., Worcester, Mass. 01606.



Documate Desk Rack

System Cuts Yard's Costs

(Continued from Page 45) shipyard, Greenlaw added.

"Before our automated system, we had to track raw material manually as it moved in and out of inventory and through the construction process, which was costly, time-consuming and administratively complicated," he said.

"Using the computer, we have reduced material and labor costs as well as 'out-of-stock' problems. This has minimized the need to work around material shortages, which has improved efficiency," he added. "Managing our material better means we have a better chance of delivering a ship on time or ahead of time."

"Other things being equal," Greenlaw added, "our cost savings can be passed on to the customer in the bid price of the ship. Specifically, this automated system allows us to provide timely, accurate information that is invaluable to BIW in developing winning bids in competition for new work. This means the customer is assured of the same BIW quality at a highly competitive price."

"This also means high-quality military ships for fewer tax dollars and lower initial overhead for commercial shippers who are seeking ways of keeping transportation costs down for their customers," he added.

Using the computer-based system, BIW buyers can make knowledgeable decisions after the computer has weighed the many variables involved.

If production schedules change, the system re-schedules the parts timetable and, at the appropriate time, prints out requisitions for additional items.

"By knowing our requirements in advance, we can maintain an ordering schedule that assures the best cooperation from our vendors," Greenlaw said.

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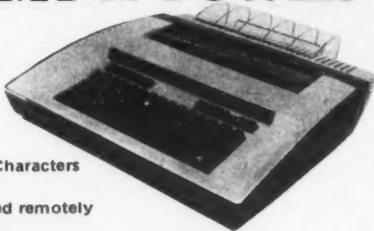


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In Drug Store Net

Business Micros Serve Concerned Public

By Esther Surden
CW Staff

PITTSBURGH, Pa. — To cope with an increased load of third-party insurance claims paperwork and to better serve a public concerned with drug interactions and possible complications, Thrift Drug Co. here is plan-

Mini Bits

Cado Turnkeys Designed For Auto, Insurance Fields

TORRANCE, Calif. — Two turnkey systems — one designed for the automotive leasing industry and another for insurance agencies — are available from Cado Systems Corp.

The Automotive Lease Fleet Management (ALFM) system features programs that provide centralized lessee processing, lease fleet management, automatic billing and receivables processing and financial information, a spokesman said.

The Independent Agency Management System (IAMS) is designed to give insurance agency management information on policies, premiums and commissions as well as the usual accounting data.

Both systems include a microprocessor CPU, a 300 line/min printer and a Teletype Corp. Model 40. The ALFM system costs \$21,995 and the IAMS system costs \$22,495 from Cado at 2730 Monterey St., Torrance, Calif. 90503.

IBM Users Group to Meet

MIAMI BEACH, Fla. — The Spring Conference of Common, the IBM small systems user group, will be held April 9 to 12 at the Carillon Hotel here.

According to a Common spokesman, the organization's membership is comprised of over 640 users of IBM 3, 7, 32, 34, 1130, 1800, 5100, 370 and Series/1 systems.

Users will meet to talk about DP management, data base management, education and manufacturing applications. IBM personnel will be present to respond to technical questions.

During the conference, attendees will take a tour of IBM's Boca Raton facility where the Series/1 is manufactured, a spokesman said.

Information is available from David G. Lister, administrative director, Common Dept. M2, Suite 1717, 435 N. Michigan Ave., Chicago, Ill. 60611.

ning a network of about 300 in-store microcomputers connected to a central data base residing on two mainframes.

According to DP director Jim Nelson, the impetus to develop this application came about seven years ago, when management forecast increased government intervention with the possible advent of national health insurance. Pharmacists already had to cope with a growing number of insurance forms, and the public was becoming more aware of drug interactions, allergies and other complications.

"We looked for a feasible way to automate the prescriptions in our drug stores," Nelson said.

Confronted with an application that had not been tried before, Thrift identified three possible ways of implementing it.

One approach it considered and then rejected was to place self-contained minicomputers in each store. This could have "somewhat restricted the size of the files" and would have presented great difficulty in communicating between stores. A lot of customers shop in more than one store, he pointed out.

Another possibility Nelson investigated was to go with a regional concept with two or more systems in distinct regions throughout the country. The cost of this method came out to be about the same as centralizing the data base, and since the firm was organized along centralized lines, it decided to

settle on implementing a centralized data base. Now Thrift had to come up with the mainframes to use. "We looked at a number of the major manufacturers; we are IBM users and have been all our careers," Nelson said, but Thrift chose two Digital Equipment Corp. KL10 CPUs because of their communications capabilities and the ability "we knew was coming."

Choosing the systems to be placed in the individual drug stores was another matter. "There wasn't a whole lot to choose from" at that time, he related. So the firm settled on Texas Instruments, Inc. 990/10 systems. Since the system was installed, Thrift has switched from the 990/10s to 990/4s with 16K bytes of memory, a CRT, keyboard and a Victor Comptometer Corp. printer.

The system located in each store is basically a sophisticated editing tool, Nelson explained. The keyboard has about 10 different function keys that activate a menu that appears on the screen. Each field is edited by the pharmacist as he enters it into the system, and certain mandatory fields must be filled out or the system will not accept the rest of the information.

Data is transmitted from the stores over 1,200 bit/sec multidrop lines and is first received by a front-end DEC PDP-11 minicomputer. The information is processed as it is received and turned around to the pharmacy in from four to 10 seconds, Nelson related. All of the communications is

(Continued on Page 54)

Control Store, Disk Options Join HIS Level 6 Offerings

WALTHAM, Mass. — Along with the Level 6 models of minis introduced recently, Honeywell Information Systems, Inc. came out with a raft of peripherals and options.

Writable control store, a feature many mini users need to configure their systems for special purposes, is now an option with the Level 6. An extension to the CPU's microprogram space, writable control store allows users to define their own instructions and implement time-critical algorithms in firmware, HIS said. The feature, invoked by special operational codes, costs \$8,000.

A microinstruction assembler and plug-in microcode analyzer to let users write their own firmware costs \$1,700.

The Level 6 systems now use 16K memory chips, which allows 256K bytes to be packaged on one controller. Each 256K-byte module costs \$27,950 for either single- or double-fetch memory with parity. With error correction, the memory costs \$30,350; it

can be used on present Level 6 systems, HIS noted.

At the same time, the firm dropped its prices for 4K MOS chip modules. For example, a 16K-byte unit of single-fetch memory with parity dropped from \$1,250 to \$1,050 while a 32K-byte unit of double-fetch error-correcting memory was reduced from \$4,500 to \$2,600.

Peripherals introduced with the systems included a mass storage subsystem that allows up to 1G byte of disk to be configured in four disk drives for attachment to a single controller. Multiple subsystems can be linked to the Level 6.

Two disk drives accommodate 128M bytes and 256M bytes at average seek times of 25 msec and 30 msec respectively. The drives can be mixed with previously announced disks on the same controller, the firm said.

The 128M-byte drive costs \$24,500; the

(Continued on Page 54)

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INTERNETWORKING

Dynus Adds Disk Controller

COSTA MESA, Calif. — Dynus, Inc. is offering a single quad-size moving head disk controller that features a bipolar microprocessor and is designed to emulate the Digital Equipment Corp. RK-11 disk system for the DEC LSI-11

mini.

Called the DL-CO3, the module directly interfaces to the LSI-11 backplane, the firm said.

The unit costs \$2,500 from the firm at 3198 G Airport Loop Drive, Costa Mesa, Calif. 92626.

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Writable Control Store, Disks Added to HIS Line

(Continued from Page 53)

256M-byte drive, \$29,000. The controller costs \$5,500.

A line printer, the Type PRU9109, increases the maximum printing speed of the Level 6 systems to 900 line/min over the previous maximum of 600 line/min. The 90 line/min system has a 64-character set and costs \$23,000. A 660 line/min version, the Type PRU9108, has a 96-character set and costs \$24,700.

The magnetic tape offering includes a controller and adapter for connecting up to four 9 track 1,600 bit/in. and dual-density 800/1,600 bit/in. magnetic tape drives to any Level 6 mini. Four types of tape drives that are mounted in 60-inch racks may be connected to the controller in any combination, the firm said.

The Type MTI9114 at 45 in./sec and the MTU9115 at 75 in./sec offer phase-encoded formats only. The other two offer both NRZI and PE formats: the Type MTU9109 at 45 in./sec and the Type MTU9110 at 75 in./sec.

The controller costs \$6,600, and the

tape unit prices range from \$8,200 to \$15,600. The tape systems will be available in the second quarter of 1978, HIS said.

The VIP 7200 display terminal will be supported as a console on Level 6, the company said. It provides a 1,920-character dual-intensity display and a numeric pad on the keyboard. It costs \$1,980 with a 64-character set and \$2,100 with a 96-character set.

Four new communications adapters that provide higher transmission speeds support the firm's Distributed Systems Environment with additional High-Level Data Link Control (HDLC) capabilities. They include broadband adapters for HDLC Bell 301/303 and HDLC CCITT/V.35 that operate at speeds up to 72 kbit/sec and an HDLC MIL 188C interface for speeds up to 19.2 kbit/sec.

In addition, a communications adapter for dual asynchronous MIL 188C interfaces that operate at speeds up to 9.6 kbit/sec was introduced. The communications adapters range in price from \$650 to \$1,600.

Drug Store Micros Serve Concerned Buying Public

(Continued from Page 53)

done under standard DEC software, he noted, and the applications residing on the host were written in Cobol by Thrift's staff.

Store Phase-In

Presently, the company has 47 stores on-line to the system, which Thrift calls Personalized Health Services. Thirty-six are in Pennsylvania, six in Delaware and five in New Jersey. In addition, 54 more stores are in test phases and will be brought up at a rate of five stores per week starting in mid-March, he said.

Some benefits have already been realized, Nelson pointed out. "We can collect third-party perscription information automatically and bill at a much more accurate level," he stated. In Pennsylvania, the company has been processing third-party claim forms by a tape-to-tape method for about a year, already significantly increasing billing accuracy, he added.

In time, the system should help reduce cash flow problems and free clerks and pharmacists for duties other than taking care of paperwork. In addition, the system should be able to cope with national health insurance, if and when it arrives.

For patients, the system gives the consumer protection against unknowingly taking a drug to which he is allergic. It stores information about all possible interactions and can keep track of certain patients who have particular problems that make them sensitive to certain drugs. Thrift employs a consultant to monitor all items added to its data base for possible interactions so that the information can be quickly added.

Consumers can request tax receipts any time of the year and gain detailed listings of their transactions. Since the system will eventually encompass some 25 states, a person needing a prescription while on vacation could go to the nearest Thrift drug store and get it.

Some 180,000 families (500,000 people) are already on the system. When the data base is complete, it will be contained on 32 200M-byte drives.

Thrift has made an attempt to design the system for 100% uptime. Right now, one of the systems backs up the other and is also used for development purposes. If necessary, a universal power supply could provide 20 minutes of power until Thrift got its two diesel generators working to provide extra power.

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And you can see most of these advantages at work at INTERFACE 78, the international data communications conference, in Las Vegas from March 6th to March 9th.

Look at what you get with the new systems.

1. BISYNC or SDLC

Raytheon now offers the industry's most complete line of communications protocols, including 2780 and 3780 batch, 3270 interactive and HASP multi-leaving—plus SDLC, which will be available in the fourth quarter this year.

That means you can select a PTS/1200 and run it under your existing protocol immediately, with no redesign of access methods or central site software. You go from where you are today to where you may want to go tomorrow.

2. Large capacity peripherals

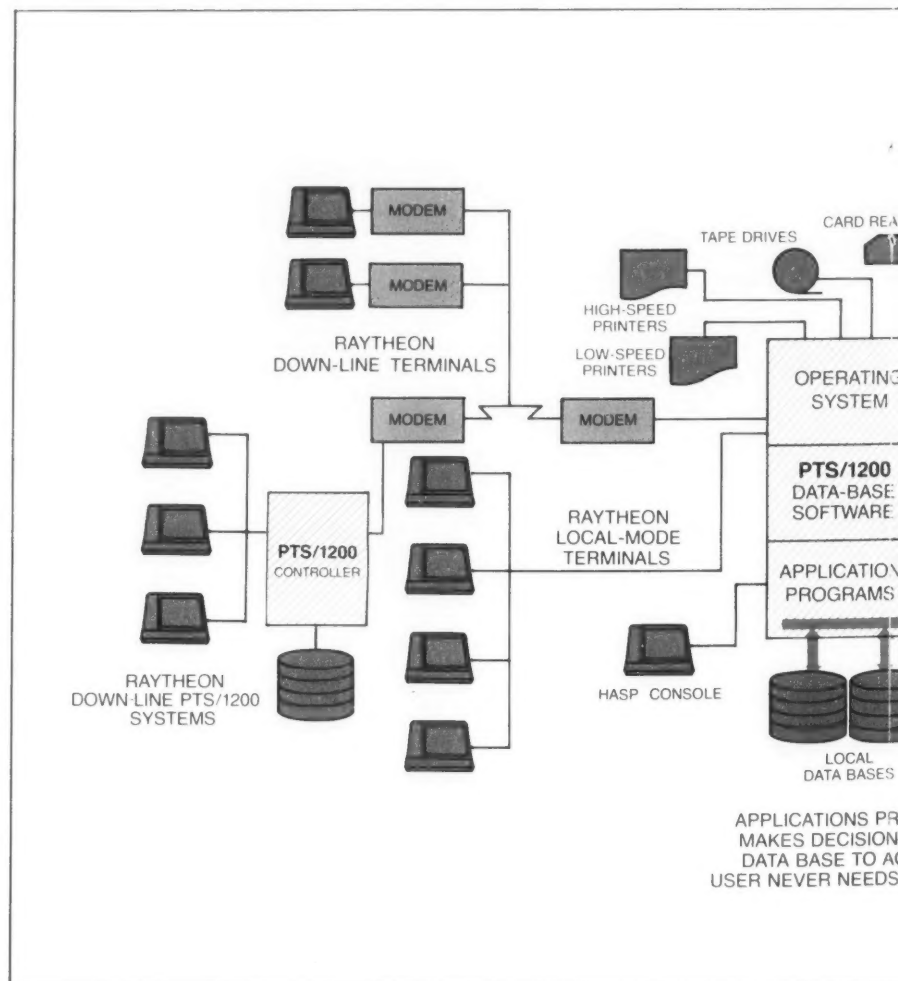
With the MARK•II system, Raytheon has added a level of peripheral power equivalent to many mainframe configurations: 80-megabyte disk drives—up to four per MARK•II for a total capacity of 320 megabytes per system, higher speed magnetic tape drives with recording densities of 1600-bpi, and a new 600 line-per-minute printer. Add that to the 20 other peripherals available on the PTS/1200, and you can configure a system to meet almost any requirement.

3. Advanced source data entry capability

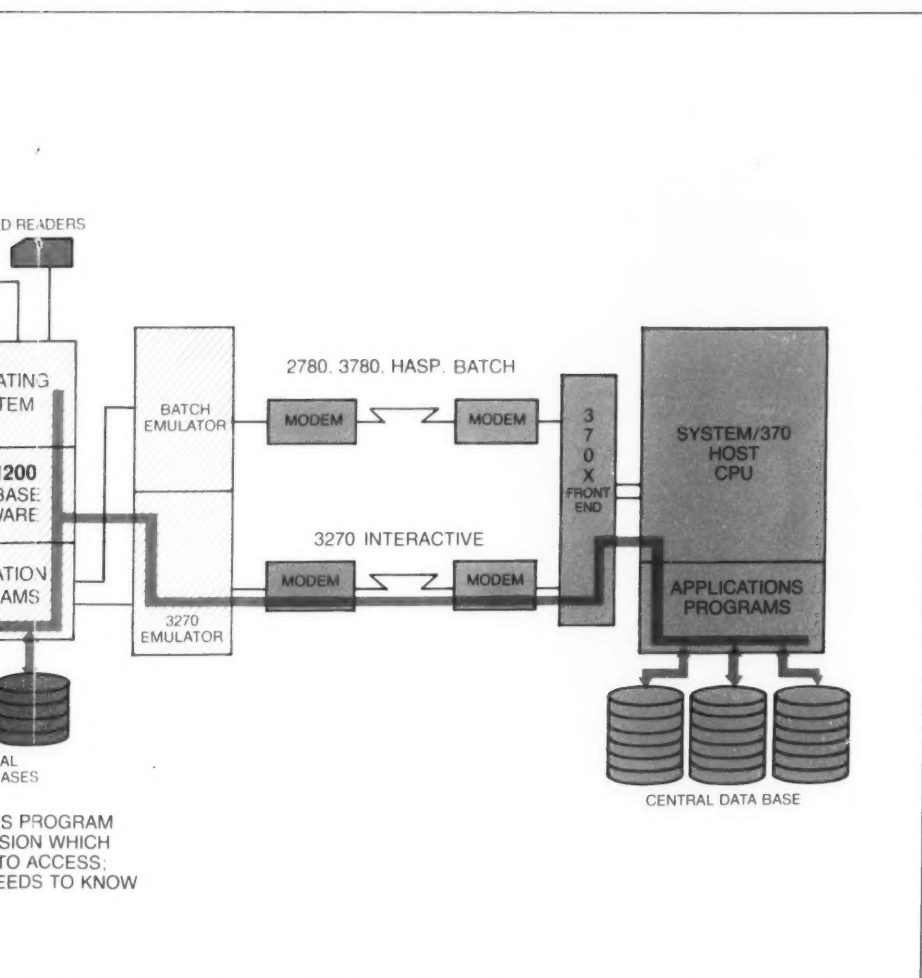
A new parameter driven source data entry package permits non-programmers to set up data entry jobs. It incorporates a full range of edit, arithmetic and logical functions. The package lets users apply standard PTS/1200 equipment to many document conversions, editing, local storage and batch control tasks. The source data entry system, while not intended for high-volume keypunch room usage, can with minimum user procedural change be adapted to handle more easily a substantial amount of the source data entry and conversion work now done by assorted other devices. All concurrently with the batch and interactive communications that makes the PTS/1200 the first of the new generation distributed processing systems.

4. Five unique network productivity features

Raytheon takes the time, the effort and the complexity out of large data networks with a series of



new ^{PTS/1200} MARK I & II



five novel network support aids:

- A **downline terminal facility** lets your PTS/1200 run a multipoint network of PTS-100 and PTS/1200 systems under 3270 protocol independent of a host mainframe. This allows further distribution of processing power to even your smallest sites.
- A **teleprinter concentrator** lets your PTS/1200 control a downline TTY network and process it locally—or pass it upstream on the same lines—at the same time as your 3270-type terminal, or HASP, or RJE, or remote batch work is being performed. It's a little extra that can cut your communications costs for teleprinter networks by more than half.
- An **enhanced software editor** incorporates significant facilities of IBM TSO software. It assists users to develop programs for their host computers by pre-editing on PTS/1200 systems. As code is developed and stored locally, it can be batched and sent to the host for analysis, editing and debugging—thus eliminating a high percentage of the message traffic and host overhead support now needed under TSO to support remote program development tasks.
- A **remote debug facility**. With it, operators at the host PTS/1200 site can patch or debug programs operating on downline systems or terminals. In just minutes, not days. And without having to send staff personnel into the field.
- And **downline program loading**. A facility that permits transmission of programs from central to remote sites. A nice extra that saves time and money.

5. Intelligent 3270 operations

Raytheon built its data systems business by emulating, and then by extending, the capabilities of 3270-type products. Within the PTS/1200 family, you can grow from basic 3270-type devices to intelligent 3270-type products, to completely concurrent on-line interactive and batch systems, to powerful free-standing local processing systems. Only Raytheon offers users a single migration path far into the future.

6. Soon, the PTS/1200 will support COBOL and word processing

Coming as part of the future of MARK-I and MARK-II is the addition of interactive COBOL to supplement our easy-to-use MACROL language, and the addition of our new Videotype word processors as peripherals in a shared data base system. By the time you are ready for those capabilities, you'll be able to get them all from Raytheon.

7. Next, 3274/3276 features

In addition to the enhanced 3270-type capabilities Raytheon now offers, shortly we will be supporting 3274/3276 features on our PTS-100 and PTS/1200 product lines.

Raytheon's ^{PTS/1200} MARK I & II— Part of the quiet Raytheon Revolution in data communications productivity.

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- ✓...The PTS-100 is the most popular intelligent terminal in the world?

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- ✓...The PTS/1200 was the industry's first distributed processing system with 3270 concurrency?

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- ✓...That Raytheon Data Systems is one of the world's largest manufacturers of digital telecommunications systems?

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- ✓...That Raytheon was the first U.S. company to link 3270-type terminals to public packet networks?

Packet networks are rapidly coming into use worldwide. They employ the X.25 standard and HDLC as link access protocols, instead of bisync or SDLC protocols. Last year, Raytheon introduced RayPACK and DMEP software packages to allow PTS-100 terminals to attach to X.25 packet networks and still appear to the host as 3270-type devices. Another example of Raytheon's commitment to lead in data communications networking.

- ✓...That Raytheon is now in the word processing business?

Soon, the Videotype CRT-based word processing products will be added to Raytheon's distributed processing systems as peripherals that share large common data bases. Another step in improving your data handling productivity.

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RAYTHEON

For Time-Sharing

Multiterminal System Bows

SUNNYVALE, Calif. — A multiterminal commercial time-sharing system is available from Advanced Information Design, Inc.

The System 3000/Model 60 is based on Interdata's 16-bit minicomputers. The unit features a time-sharing operating system that allows a business to run its company's accounting on the system as well as sell time to outside users, the firm noted.

An optional Integrated Accounting and Distribution system, designed for distributors, manufacturers, certified public accountants and service com-

panies, includes general ledger, accounts receivable, accounts payable, order entry, invoicing, purchasing, inventory control, payroll and word processing applications. Programmable in the firm's Virtual Basic as well as Cobol, Fortran IV and assembler, the system features remote diagnostic support to the firm's home office.

Standard peripherals on the system include a graphics CRT, 120 line/min printer and one 10M-character disk drive with both fixed and removable media. The basic system costs \$33,270, including operating software and the company's language. The applications packages are available for \$3,000 from the company at 1240 Elko Drive, Sunnyvale, Calif. 94086.

Systems Display Color Graphics

ATLANTA — A line of microcomputer-based color graphics systems has been announced by Chromatics, Inc. here.

Each model in the line includes a Zilog Z-80 CPU with full memory and I/O structure, the firm said.

The devices are available in 13-in., 15-in. and 19 in. color screens, using high resolution shadow mask tubes.

Standard interfaces include synchronous and asynchronous variable transmission rate serial I/O with TTL and RS-232C. Optional interfaces include RS-422, IEEE-488, 20Ma current loop, an additional serial port and parallel 8-bit or 16-bit port with a direct memory access controller.

The Chromatics CG series has graphics resolutions of 512 by 256 and 512 by 512 individually selectable and color-definable dots. Graphics functions include automatic generation of circles, arcs, rectangles and solid filled objects, as well as vector and concatenated vectors, the firm said.

Optional Function

An optional CREATE and REDRAW function allows recreation of graphics and alphanumerics drawn on the screen from the keyboard or with a light pen.

Alphanumerics may be placed at any point on the screen and may be multiplied to any integer size in both height and width, the company noted. A standard Ascii set is provided along with 96 separate user-definable graphic symbols. Up to 196 user-definable graphic symbols are optionally available, it added.

Using a windowing capability, the screen can be divided into a maximum of four separate independent CRT areas, with individually user-selectable window size, position and cursor, the vendor said.

The Chromatics CG series can also be used as a Z-80 development system with the optional minifloppy disk and full size single and dual disk systems.

Prices for the Chromatics CG series of graphics computers begin at \$8,995 for the CG 1398 model, which includes a 13-in. eight-color CRT system, Z-80 microprocessor, full 128-key function, keyboard, 512 x 256 individually definable and color-coded points and standard Ascii alphanumeric characters with 96 user-definable graphic characters.

Chromatics, Inc. is located at 3923 Oakcliff Industrial Court, Atlanta, Ga.

ROM Fits DEC LSI-11s

PALO ALTO, Calif. — A bank-switchable read-only memory (ROM) system, called the ROM-016, has been developed by Digital Pathways, Inc.

The unit functions within Digital Equipment Corp. LSI-11-based computers and is contained on a single quad board. It will accommodate up to 16K 16-bit words which have been programmed into Intel Corp. 2716 erasable programmable ROMs or 2316E ROMs.

Because of the addressing structure that has been incorporated within each board, it is reportedly possible to expand the system beyond the normal address limitations of the LSI-11.

The memory is physically divided into four independent "blocks," each containing 4K words. Each block can be enabled and assigned a portion of the available address space through either a set of manual switches or a device register.

Block Switched

When enabled and assigned address space manually, the memory responds similarly to all other ROM systems. However, when the block assignment is carried out through the medium of a device register, blocks can be switched in and out within microseconds, the firm said.

The ROM-016 costs \$695, from the firm at 4151 Middlefield Road, Palo Alto, Calif. 94306.

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Edited by Ron Frank, *Data Communications Terminals* will focus on the choice and selection of special terminal equipment for specific types of data communications networks, such as point-of-sale or EFTS. It will include topics like these:

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- General and special-purpose terminals in dedicated networks.
- Characteristics of terminals that help to improve the man-machine interface and make them easier to use.
- Fitting the terminal to the job instead of making management rearrange itself to fit the equipment.

Whatever kind of data communications you're involved in, you need terminals. So dial up this special report and stay ahead of this rapidly changing field.

If you're marketing terminal products or services, your ad should be there on March 27th. Closing date is March 10th. For more details, contact your *Computerworld* sales representative. Or call Terry Williams at (617)965-5800.



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"We selected a DECSYSTEM 2040 with 128K words of computer memory and 40 million words of disk storage and quickly expanded to 256K words and 80 million words of disk storage.



R. Micklas, Project Manager, ADAR System, RCA Corporation Missile and Surface Radar, Moorestown, New Jersey



"Our experiences show that growth doesn't have to be accompanied by growing pains; no software to re-write, no obsolete hardware to replace.

"The people here are really impressed by the maturity and scope of the 20's Operating System and high level languages. For us it has been a superior, cost effective system."

Software. "Information Consultants, Inc., ICI, is a computer service and consulting firm specializing in time-sharing, primarily for the Federal Government.

"When we selected our computer system last year, our customers' requirements were important criteria. To satisfy those needs, our interactive system had to offer a variety of user-oriented languages. It had to be compatible with other manufacturers' equipment. And it had to operate in a secure environment with high reliability. The DECSYSTEM-20 met all of these requirements and then some.

"Compatibility is especially important in our case. ICI develops proprietary software — like ADMIT, a financial modeling, budgeting package. This software is developed on the DECSYSTEM-20 and is implemented on other

Merle Garvis, President, Information Consultants, Inc., Washington, D.C.

digital

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manufacturers' hardware.

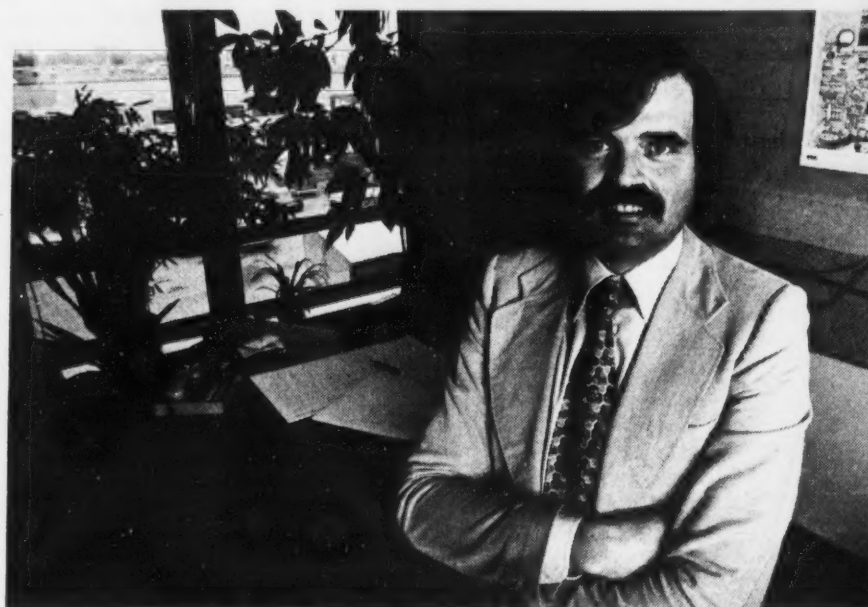
"Finally, we had to be sure that our future needs would be met. We determined that the DECSYSTEM-20 represents the state-of-the-art in interactive computing today and has the growth potential we require."

Productivity. "At Dorsch Consult, we were faced with an extremely sensitive problem. All our programs were running on a Univac operating system and obviously our programmers were comfortable with it. But, because we had to share the Univac with other customers, turn-around time was increasing and we needed more productivity.

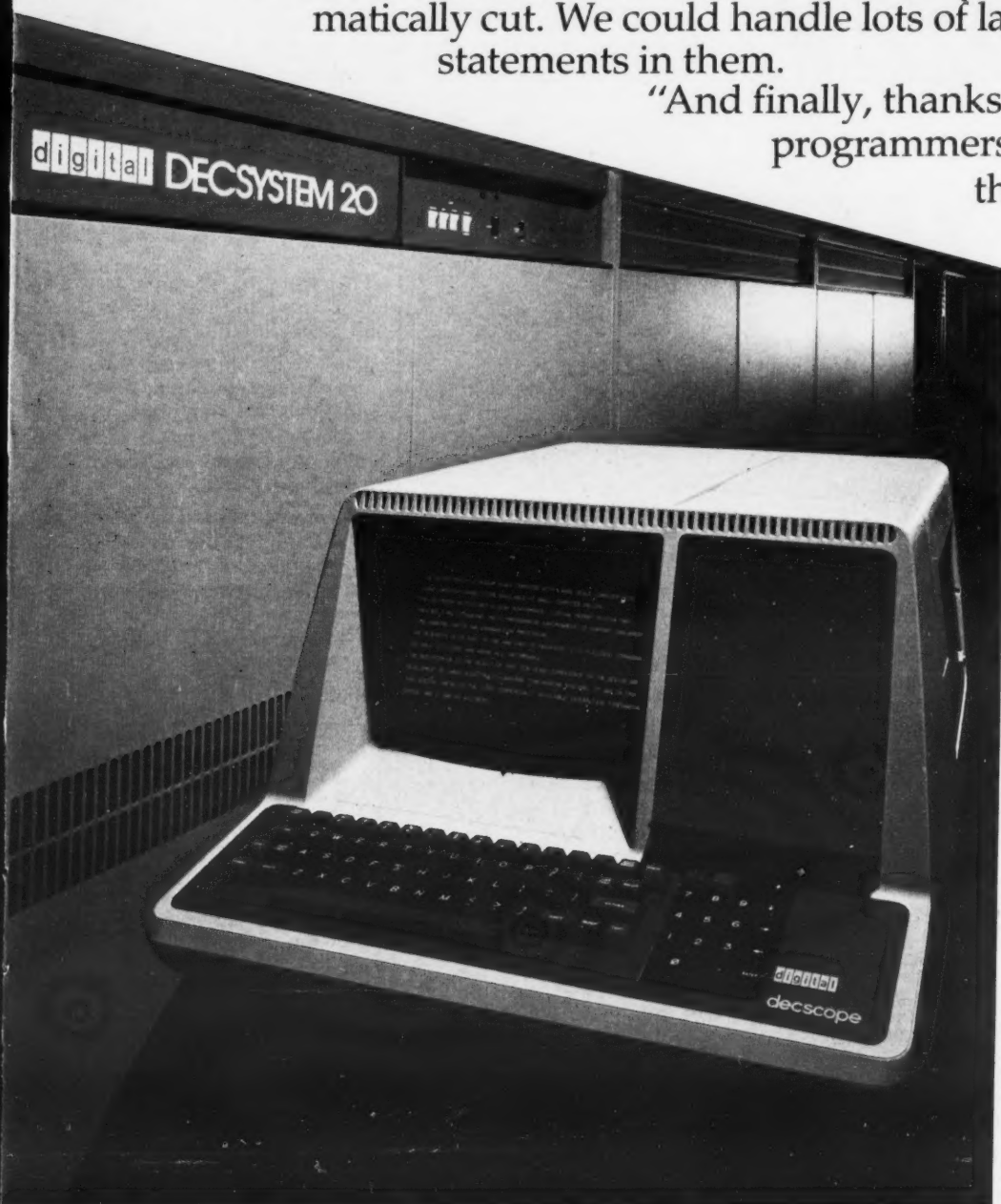
"In our search for more computer power, we became tremendously enthusiastic with the speed and capacity of the interactive DECSYSTEM-20.

"Once we had installed one, we were truly amazed. Turn-around time was dramatically cut. We could handle lots of large programs — some with up to 50,000 statements in them.

"And finally, thanks to the TOPS-20 operating system, our programmers had very little trouble switching to the new system."



*D. Kornblicher, EDP Manager
Dorsch Consult, Munich, West Germany*



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Cleaner Built For Cassettes

TARZANA, Calif. — A digital cassette cleaner compatible with 'Philips-style' cassettes has been unveiled by Innovative Computer Products.

The Model 100 cleaner uses a built-in blade to remove surface contaminating particles.

The unit is priced at \$300. Innovative Computer Products is at 18360 Oxnard St., Tarzana, Calif. 91356.

PDP-11 Gains ROM

HOUSTON — Computer Extension Systems, Inc. here has a 32-word (16-bit) read-only memory (ROM) it said fits directly into the small peripheral controller slot of the Digital Equipment Corp. PDP-11.

The ROM11-32 is functionally equivalent to the DEC M792 programmable read-only memory, the firm said. Designed to either be user-programmed or factory-preprogrammed to user specifications, it operates from the existing PDP-11 5V power supply, a spokesman noted.

In a typical application, up to eight of the units can be combined to set up a small ROM to contain nonerasable recover routines or other frequently used routines.

The ROM11-32 costs \$285 from the company at 17311 El Camino Real, Houston, Texas 77058.

Quodata Business System Based on DEC PDP-8 Mini

HARTFORD, Conn. — Quodata Corp. has designed a minicomputer based on the Digital Equipment Corp. PDP-8 for business applications using Quodata's own programming language.

Included in the system, dubbed the QDP78, is DEC's VT78 unit with 32K bytes of memory, CRT, upper/lower case keyboard, Decwriter II printer, dual-diskette drives

and desk.

The system uses Qbol, a business language the vendor said is compatible with DEC's Dibol but runs under the OS/8 operating system. Fortran IV and Basic are also included, the firm said.

Users can substitute a 180 char./sec printer for the 30 char./sec Decwriter if they wish and may also add another dual-diskette drive, Quodata said. For users requiring more storage, hard disks can be attached.

In addition, with the aid of other equipment, the unit can be expanded to a 16-user multiple language time-sharing system, according to the vendor.

Maintenance for the system is provided by DEC, Quodata said. The unit costs \$9,990 from the firm at 196 Trumbull St., Hartford, Conn. 06103.

GRC Mini Gets Memory Boost, Price Reduction

HARTFORD, Wis. — General Robotics Corp. (GRC) has increased the memory available on its CD/X3 minicomputer from 40K bytes to 56K bytes while reducing the system price by 15%, according to a company spokesman.

The CD/X3 is a Digital Equipment Corp. LSI-11 microcomputer system including a 20M-byte cartridge disk drive and a 60 char./sec teleprinter.

The disk is four platters (three fixed and one removable), each contain 5M bytes.

The teleprinter offers a 7 by 7 dot matrix impact printer with keyboard and prints up to five-part forms with bidirectional printing and a 132-column width.

The standard configuration with LSI-11, 56K bytes of MOS memory, 20M-byte disk, teleprinter and operating system costs \$19,900.

The firm is located at 57 N. Main St., Hartford, Wis. 53027.

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As far as features go, you couldn't ask for more. An error correction code (ECC) is part of the package. So is an operator oriented self-test capability

and removable media. The latter is a big plus for protecting your data files. Maintenance is easy, too, because the 677 has only three moving parts. All read-write heads are easily accessible, and so is the entire electrical package which is housed at the top of the cabinet.

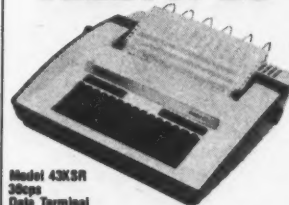
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Does Patient-Care Chores Mini-Based Unit Eases Nurses' Job

By a CW Staff Writer

MIAMI — A minicomputer-based system has freed up nursing time by handling business and patient care applications at the Green Briar Nursing Home, according to Russell Silverman, assistant administrator.

In addition to the basic accounting functions, the nursing home system performs patient billing and keeps track of medication, treatment, diet, diagnosis and general patient care, Silverman said.

The system lists the physicians with their patients so nurses can contact the doctors easily in case of emergency or for general information questions, he said.

Saves Nursing Time

Patient medication formulas entered into the system are available on-line so nurses can save time in preparing medicine. New orders for medication and treatment are added as they come in.

The system also allows doctors to review and renew the medicine and treatment they have prescribed every four weeks, according to Silverman, who said this automated method eliminates manual transcribing and stops a lot of errors that would otherwise occur.

The system also enables information about a patient, such as name, all doctor orders, diagnoses, room number, religion, special treatment and medication to be put on one record for access by the doctor or nurse, Silverman said.

System Adds Control

With the mini, the hospital administration can get better information, keep tighter controls and have a system that is more adaptable and easy to use, Silverman said.

The system is programmed to prepare a listing of each patient's problems and possible ways to solve them, Silverman said.

The nursing staff was somewhat reluctant to use the system when Green Briar first got it, but once the nurses realized it could ease their work, they were happy with it, he said.

The system reduces the amount of paperwork the hospital handles by 50% and frees up nursing time for more direct nursing care, according to Silverman.

The time saved is approximately one hour per patient each month, which adds up to 180 hours of nursing time each month, he said.

The only problem with the system is that "we are progressing faster than anticipated. Our software house had to keep up with us," Silverman said.

It took only one month to convert to the system and test the accounts receivable and patient billing programs, he said.

Set Up Master File

The first step in the billing program was to set up a master file including name, address, phone, where the patient came from, hospital or another nursing home, diagnosis and other pertinent information for Medicare billing.

The master file has an automatic feed-in to the patient census which

keeps track of patients entering and checking out of the nursing home. The patient census allows the nursing home to track the duration of stay and accrued costs of both the private and Medicare patients.

Medicare pays a flat amount per day for each patient until an audit cost report is done to determine the difference between the flat amount and the actual cost. The billing analysis for Medicare formerly took one and a half months to produce and verify but now is done along with each bill as it is produced, Silverman said.

More Information

Green Briar first automated its

180-patient nursing home six years ago with a Burroughs Corp. L5000, but eventually found it to be too cumbersome; it also needed to provide more information to the nursing staff, Silverman said.

In 1977, Green Briar switched to a Digital Equipment Corp. PDP-11/34 minicomputer. In addition to the mini, the system includes two 45M-byte disks, a 64K-byte memory, 180 char./sec printer and two terminals. The system costs approximately \$55,000.

Green Briar is planning to add an additional disk, upgrade to a 128K memory and test a program which will expand the system to six terminals.

Disks Loaded

PASADENA, Calif. — For users needing some way to back up their fixed or Winchester-type disk drives, Data Electronics, Inc. has introduced "The Funnel," a 6,400 bit/in. 1/4-in. cartridge tape drive.

Designed to load and unload fixed-disk systems, the unit features 4-track serial recording and can accommodate 11.5M bytes of data. The data transfer rate for the system is 192 kbit/sec.

Noting that the unit is small and light, the vendor said four units can provide about 46M bytes of on-line storage in a 7-in. panel.

The unit costs \$1,500 from the firm at 370 N. Halstead St., Pasadena, Calif. 91107.

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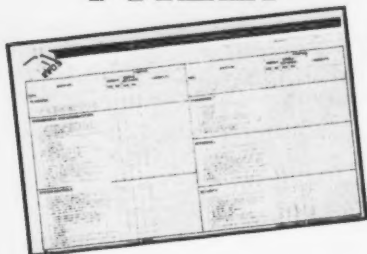
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Securities Trader Uses Dual CPUs

NEW YORK — A.G. Becker & Co., Inc. recently installed a computer system to automate the paperwork associated with its daily trading, to provide capacity that will support higher volume and to maintain operational control, according to the Wall Street securities trading firm.

Built around dual Hewlett-Packard Co. 3000 Series II systems with 24 terminals, the system updates the company's portfolio with each transaction and prints the necessary receipts and bills for securities delivered and received. It also performs necessary calculations, makes ledger postings and provides management with summaries of company financial status and holdings.

Becker developed the custom-designed and configured system with help from R. Shriver Associates (RSA), a management services company located in Parsippany, N.J.

The most important advantage of the system, according to Bob McCausland, Becker's project manager and vice-president, is that it speeds the availability of information so that financing can be arranged most expeditiously on major purchases.

"Speed is key for financing and the HP system gives management a snapshot of the flow of inventory," McCausland said. "Our average transaction is about \$2 million and the financing costs are enormous. Timely information helps limit these costs and contributes in an important way to the profitability of the business."

"The system also enables the firm to process more business with the same number of employees by lowering unit costs with expanded control over higher volumes," McCausland noted.

Backup Provisions

Two HP systems are used here because the security trading business cannot tolerate much downtime, according to Bent Rasmussen, system designer and project manager for R. Shriver Associates.

"When you're dealing with security trades that entail millions of dollars in each transaction, you're in bad trouble if you can't operate. For example, if securities aren't delivered to banks before they close at 3 p.m., thousands of dollars can be lost in interest," Rasmussen explained.

There are two 15M-byte disk memory storage files on each of the systems. These disks contain the file of daily transactions, which may run to 2,000, the inventory file of 1,500 different positions, the security master file of perhaps 1,500 issues and the account master file of about 7,000 accounts.

At the same time that transactions are recorded on disk, a magnetic tape on the first unit also records them. Should a breakdown of the first system occur, the tape is also used to read the transactions into the disk of the second unit. In minutes, that unit becomes current.

The system also does simultaneous real-time updating of both units' disks. At the end of each day's business, the transaction file is cleared from the disk preparing it for the next day's file of transactions, McCausland explained.

Each day, when the securities markets and the traders open for business, Becker financial managers review their inventory of securities.

If the security is bought, the buyer prepares a hand-written ticket of the purchase which is taken to the operator of one of the HP 2640 CRTs. The terminal operator keys in the transaction by indicating whether it is a buy or a sell, and the computer then places the appropriate format on the screen, McCausland said.

The operator then fills in the form with information such as security identification numbers; security type; transaction code; account traded for; delivery instructions; face amount; maturity date and interest rate.

The Becker system accommodates all types of credit instruments, including all U.S. government securities (interest and discount), all U.S. agencies' issues, bank holding paper, certificates of deposit and banker's acceptances, according to McCausland.

When the form on the screen is completed, the operator pushes the "enter" key and the system performs a verification step, checking for missing data and account validity, and determining whether the system posts the security purchase.

It then adds the security to the inventory and prints a receipt ticket multipart form that also includes the description of the agency or corporation issuing the security.

This ticket is printed out on a terminal printer and used to receive the purchased security. In the case of a sale, the system performs a similar task, reduces the inventory and produces a billing ticket used to deliver the security.

Security Inventory

At the completion of the day's business or at any point during the day, the system can be used to produce a complete and detailed list of the security inventory. This listing may also include the exact denomination of each security certificate, McCausland said.

The system also maintains updated customer files, calculates transactions on-line, prints customer confirmations, maintains pending files, maintains the "stock record," produces required operations reports and produces required management reports, he noted.

These reports include stock record/inventory detail, trade recap, trade transaction detail, cash sheet summary, cash sheet detail and purchases and sales journal. Additional reports cover the bank loan balance, daily repurchase outstanding, securities pending and profit and loss.

Becker looked at Digital Equipment Corp. and Data General equipment as well as the IBM System/3 and a few others, but settled on HP primarily because of its software capabilities, McCausland said.



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End to 'Near Monopoly' Forecast

IBM Warned: Beware of Personal DP

By Edith Holmes

CW Washington Bureau

WASHINGTON, D.C. — The small personal computer is the only force on the horizon that will break IBM's "near monopoly" of the computer industry, Dr. Portia Isaacson, co-owner of the Micro Store in Richardson, Texas, and last year's National Computer Conference chairwoman, told Federal DP Expo attendees here recently.

"IBM is nervous," in Isaacson's view. The industry leader has just begun to drop its prices to stay competitive, she said, adding her belief that the corporation will continue to do so before it enters the personal computing marketplace.

But IBM isn't the only company that should beware of personal or low-cost computing.

Cheap, abundant computing capability also means the end of time-sharing services, Isaacson predicted. Personal computing is replacing time-sharing — originally designed

to provide each individual or program with a slice of a big computer. Now people can take their own black boxes home or to work.

"We really don't need time-sharing anymore," Isaacson said. "It will only survive as long as its developed software holds out. Ultimately, the shared disk will be the only time-sharing service that remains."

Personal computers are also replacing minicomputers, particularly at the low end of process control, Isaacson stated. While IBM cuts prices, mini makers exhibit their nervousness by putting their equipment into retail computer stores, she said.

Personal computing is undermining yet another force in the industry: the mystique of it all. When the computer becomes just another home appliance — albeit the controlling one — the black art qualities associated with the computing professions will vanish, Isaacson said.

As the public becomes computer-literate, the qualifications for entry-level programming and analyst jobs are likely to go up.



CW Photo by E. Holmes

Dr. Portia Isaacson

Meanwhile, the salaries for those and other positions associated with computing will go down, she stated.

(Continued on Page 66)

Mail Order Firm Plans to Make Good

By Tim Scannell

CW Staff

FULLERTON, Calif. — Associated Electronics is broke today "because we took an honest interest in our customers... and went out of our way to help" them, according to Brice Ward, president of the now-defunct firm.

It is "not our intent, has not been our intent and never was our intent" to cheat anybody out of anything, Ward insisted.

Last month an ad appeared in a national computer hobbyist publication offering an erasable programmable read-only memory (Eprom) board kit from Associated Electronics. Unbeknownst to the people who ordered the board, Associated Electronics had closed down two months before the ad appeared.

When customers tried to call the firm to find out why they had not received what they ordered, they discovered the telephones were disconnected and the building here was empty.

A spokeswoman for the Fullerton Chamber of Commerce could give little assistance in locating the "missing" company. "We've had long distance calls on that firm from other people who have been looking for them," she stated. "We had people go by there, but there's nothing we can find out — they're just gone."

Although the Better Business Bureau said that Associated Electronics "did respond to complaints" from dissatisfied customers, it wouldn't elaborate.

The Fullerton Police Department, however, proved to be more helpful. It supplied the number of a post office box through which the president of Associated Electronics was reached.

'We Haven't Disappeared'

"We haven't disappeared anywhere," Ward stated. The telephones, although disconnected for a time, are now operating — the number is (714) 539-0735 — to assist in customer queries, he noted.

"I'm honestly and truthfully furious about the whole thing," Ward said in response to charges he tried to defraud his customers. The 20 or so people who did not get the material they ordered will either get their product "or get a refund when we are in a position to refund the money," he pledged.

The reason Associated Electronics folded is

simply because of a lack of money, Ward said. "If a customer had trouble with one of our Eprom kits, we would repair it even though we had no obligation to do so. The responsibility for repairing those things rested with the guy who built the kit," he pointed out.

"We not only went to the extent of servicing the things and returning them to the customer free of charge, we also, in some cases, redesigned the whole card on the assumption there might have been some problem in the original construction," he continued. "It cost us a fortune."

"There are about five [customers] who are complaining... and I don't blame them," Ward said. "We've made arrangements with Byte Industries of Sunnyvale, Calif., to

manufacture these cards. It has assured us it will supply memory boards to the people who ordered cards from us."

"I can remember when we were down in our building in Irvine, Calif.," Ward said, reminiscing about his business. "My wife would sit and wait for me to finish work," which he said wouldn't be until 2 o'clock in the morning. "Our kids would be curled up in a corner on a sleeping bag, while I tried to get products out to our customers."

Nobody "noticed or acknowledged us when we were still viable," Ward said, but "now that we're out of it all, all of a sudden we are really grist for the mill."

Ward and Associated Electronics can be reached at P.O. Box 1720A, Garden Grove, Calif.

West Coast Faire Opening Friday

SAN JOSE, Calif. — The three-day Second West Coast Computer Faire will begin Friday at the San Jose Convention Center here.

The Faire, whose organizers expect more than 10,000 visitors, will feature four keynote speakers at two banquets, over 200 booths of exhibits and 50 to 80 conference sessions, tutorials and technical talks.

Each of the banquets will have two speakers; one will discuss "present world" concerns and the other "future world" topics.

Friday's "present world" speaker will be Dr. Adam Osborne, president of Osborne & Associates of Berkeley, Calif., who will discuss "Significant Personal Computing Events for 1978." He will also be giving the first presentation of his "Maybe-Annual, Unilateral White Elephant Award for 1977" in personal computing, a Faire spokesman noted.

Alan Kay, Friday's "future world" speaker, will tell attendees, "Don't Settle for Anything Less." Kay is a scientist at Xerox Corp's Palo Alto, Calif. research center and head of its Learning Research Group.

Saturday's "present world" speaker will be Dr. Portia Isaacson, who will discuss how "Dinky Computers Are Changing Our Lives." Isaacson is the Chairwoman

of the Association for Computing Machinery's Special Interest Group on Personal Computing.

"All Those Things You Wanted to Computer, But Didn't Think You Could Afford," is Saturday's "future world" topic. Bill McKeeman from the University of California at Santa Cruz will make the presentation.

A major portion of the Faire's program will be dedicated to "Computers for the Physically Disabled." The section's keynote speaker will be Dr. Robert Suding of the Digital Group. He will focus, according to the spokesman, on where the microcomputer revolution is going in the solution of the many needs of handicapped persons.

To assist the disabled who attend the Faire, organizers will be providing simultaneous translation of selected conference talks for the hearing-impaired as well as offering a special \$6 fee for 3 days' admission. The convention center is equipped with facilities for the disabled.

At-the-door registration Friday will cost \$8 and be good for all three days. Saturday registration at the door will cost \$9 and be good for two days and Sunday-only registration at the door will cost \$8. Those below college age with student identification will be charged \$6, as will senior citizens.

MICROCOMPUTING

Micro Bytes

Signetics Reduces Price of ABC Kit

SUNNYVALE, Calif. — Signetics has reduced the price of its Adaptable Board Computer (ABC) 1500 kit from \$190 to \$89.95.

Assembled and tested, the unit is now available for \$149, reduced from \$275.

The ABC 1500 includes a 2650 microprocessor with 1,000 bytes of read-only memory and 512 bytes of random-access memory, serial and parallel I/O ports and a dual monostable on-board clock.

Signetics is located at 811 E. Arques Ave., Sunnyvale, Calif. 94086.

Personal DP Seen Bane of IBM

(Continued from Page 65)

The prestige will go out of the corporate DP executive's job; he is no longer managing so expensive — although still so valuable — a resource.

Depressed? Isaacson laughed as she contemplated the future worth of her Ph.D. in computer science.

No, not alarmed, she said. "We are incredibly lucky" to be present at the dawning of the "age of abundant computing."

For Isaacson and many others, personal computing means an infinite number of possible computer applications; it means the continued growth of an industry and of an important tool.

Think of the possibilities, she suggested. It's possible to simulate the stock market, do astrological analyses,

play Star Trek, run a computer dating service, use a system as a smart typewriter for text composition, learn to program, get into the biorhythm business, project one's personal finances, file family genealogical information, keep an inventory of stamp or beer can collection, drill your kids in arithmetic.

Litter Box the Clue

When Isaacson first opened her computer store in Richardson, one of nearly 500 computer stores in the U.S. today, she wasn't sure who her first customer would be. She may have expected an engineer or computer-type; what she got was an art professor from Southern Methodist University.

It wasn't until her store was asked to debug a system that a cat had mistaken

for its litter box, however, that Isaacson really knew computers had come home.

Today's computer store offers personal computing users equipment from about a half-dozen of the more than 100 manufacturers in the field. The leaders, Isaacson said, are companies specifically formed to produce computers and peripherals for this market: Processor Technology, Mits Altair, Cromenco and Southwest Technical Products.

Even offerings from such traditional computer companies as Perdec, Intel and California Computer Products can now be found in computer stores, she pointed out. Electronics companies such as Heath and Radio Shack have already jumped into the business and they will soon be followed by Texas Instruments, she stated.

In addition to personal computing equipment, computer stores sell books. They also service and maintain software, provide consulting services on how to configure a system for a given application and are heavily involved in computer education, Isaacson said.

In her opinion, the store that caters to small business and industrial applications, the store that is really "a small systems house in disguise as a retail outlet" has the greatest potential for growth.

Those computer stores that have catered strictly to hobbyists and are now having financial trouble have misjudged the market, Isaacson contended.

A third type of computer equipment outlet — the home or consumer store that carries fully assembled systems and competes with Sears Roebuck and Co. — will do better than the hobby computer stores, but not as well as the "disguised" small systems house, she said.

Ultimately, Isaacson believes millions of personal computers will be sold for home as well as small business and industrial use. What the personal computing industry needs now is a huge library of applications programs, she said.

And Then Came Disk

Last year saw the advent of disks for personal computer systems and the beginning of application software development, Isaacson noted. She predicted that in 1978 the industry will develop hard disks subsystems.

"Graphics will be the other area of great innovation this year," Isaacson said. Better black-and-white and color set resolution and good software support are essential to the growth of graphics, she stated.

Graphics, in turn, are important because they will help solve the human interface problem. Consumers will be much more attracted to personal computer systems with graphics capabilities, she suggested.

Hoping to have converted some members of the Expo audience into personal computing buffs, Isaacson recommended that anyone interested in a computer of his own should choose a computer store that is nearby and trustworthy.

"Secondly, buy a computer that the store backs and is willing to service," she advised. "If a store recommends them all, your best bet is to go on color."

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- Case Studies: Data Base and the Executive; Potentials of Distributed Data Processing.
- Presentations: Trends and Opportunities in System Financing; The Computer Resource of the Future.

WEDNESDAY

Double Conference Day

(Two simultaneous conferences)

You're bringing in a first computer system for a small company, you're involved in light, inhouse use of computers (maybe about to trade up), or just thinking of your own system. You'll want to attend the Program on Small Business Systems.

You're interfacing with computer personnel on a day to day basis. The Program on Managing People Problems is designed just for you.

Here's your schedule:

Small Business Systems

- Keynote Speech: "Data Processing in Small Business Today," by an official of Arthur Andersen and Company
- Case Studies: Computer Uses in Financial Reports; Computer Uses in Operations Planning & Reporting
- Presentation: How to Negotiate with Vendors • Days-end panel that includes you, your questions, views and comments.

Managing People Problems

- Keynote Speech: Given by a recognized expert in data processing personnel management • Case Studies: Career Pathing for Operators and Programmers; Improving the User/DP Relationship • Presentations: Testing for DP Competence; Coping with Security/Privacy Regulations.

THURSDAY

You're a manager or technician, and your organization is thinking of distributing its computer resources to regional offices and plants. This is your can't-miss day:

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- Keynote Speech: "Critical Issues in DDP" • Case Studies: Applications for DDP; Equipment Selection
- Presentations: Networking Aspects of DDP; The Data Base Question.

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Midwestern Computer Expo

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L **LOOP** — 1. Basically a self-contained series of instructions in which the last instruction can modify and repeat itself until a terminal condition is reached. The productive instructions in the loop generally manipulate the operands, while bookkeeping instructions modify the productive instructions and keep count of the number of repetitions. A loop may contain any number of conditions for termination. The equivalent of a loop can be achieved by the technique of straight-line coding, whereby the repetition of productive and bookkeeping operations is accomplished by explicitly writing the instructions for each repetition. Synonymous with cycle 1. 2. A communications circuit between two private subscribers or between a subscriber and the local switching center.

M **MACHINE CYCLE** — The shortest complete process or action that is repeated in order. The minimum length of time in which the foregoing can be performed.

MACHINE LANGUAGE — The final language all computers must use is binary. All other programming languages must be compiled or translated ultimately into binary code before entering the processor. Binary language is machine language.

MACRO ASSEMBLER — A macro assembler simplifies coding when similar sections of code are used repeatedly, but variations preclude the use of conventional subroutine techniques. With a macro assembler, a single instruction yields the necessary expansion without undue complexity.

MACRO CODE — A coding system which assembles groups of computer instructions into single code words and which therefore requires interpretation or translation so a computer can follow it.

MAGNETIC CORE STORAGE — A type of computer storage which employs a core of magnetic material surrounded by a coil of wire. The core can be magnetized to represent a binary 1 or 0.

MAGNETIC TAPE — Flexible plastic tape, e.g., 1/2-in. wide, on one side of which is a uniform coating of dispersed magnetic material, in which signals are registered for subsequent reproduction. Used for registering television images or sound or computer code.

MAINFRAME — Refers to the basic or main part of the computer, i.e., the arithmetic or logic unit. The central processing unit.

LEARNER'S LEXICON

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Regarding Capital Formation

Adapso Urges Changes in Federal Policy

By Jeffry Beeler
CW Staff

WASHINGTON, D.C. — Two spokesmen for the Association of Data Processing Service Organizations (Adapso) recently urged the federal government to revise its policies on capital formation for the computer services and other technology-based industries.

In testimony before the U.S. Senate Committee on Small Business, Leslie Srager, secretary and general counsel of National CSS, Inc. of Norwalk, Conn., and John Imlay, the association's senior vice-president, said the computer services area still requires more favorable government attitudes toward venture capital and new business financing, even though it is the second largest sector of the \$31 billion computer industry.

Computer services firms must remain in the forefront of emerging technology to stay in business, Srager said. Unfortunately, keeping abreast of the rapid pace of technological developments demands massive transfusions of investment capital.

Most computer services firms, however, lack the financial wherewithal to generate

this capital internally, Srager explained. Nor can they easily attract the necessary financing from outside sources.

In fact, some 2,300 of the estimated 2,600 corporations in the computer services industry gross less than \$10 million annually, well under the \$20 million that most venture capital firms regard as the minimum qualification for their financial services, Srager noted.

As a result, most computer services firms experience great difficulty obtaining much needed investment capital, and the problem is becoming more serious each year, Srager warned.

MSA Story

The history of Atlanta-based Management Science America, Inc. (MSA) provides a convenient case in point.

In 1971, MSA declared bankruptcy but later reorganized with help from debtor relief provisions of the Federal Bankruptcy Act and the Internal Revenue Code. Unfortunately for MSA, the provisions that fostered the company's comeback no longer

exist, and "we are again facing the problems that confronted us in 1971," according to Imlay, the firm's president.

Moreover, many other computer services firms face a similar crisis, primarily because of tax system inequities and federal business regulations that favor the few giants of the industry, he added.

"The conventional markets (for capital) are foreclosed to us by virtue of the accounting principles with which we are burdened," Imlay noted. "In order to grow and expand, we must have additional capital."

If they don't receive that extra capital, many of the companies in the computer services industry will either grow at a prohibitive cost and become unprofitable, or stagnate and become noncompetitive, Imlay said.

Potential Being Limited

Echoing Imlay's sentiments, Srager warned that "the potential of companies in our industry is being limited by restrictions in the availability of venture capital and capital formation." As a result, some computer services firms have experienced difficulty in expanding their product lines through increased research and development, penetrating new product and geographical markets, acquiring highly skilled new computer personnel and competing with other suppliers of computer technology and equipment.

Other companies in the industry have gone out of business entirely or have been forced to sell out to much larger competitors and thus hastened the process they fear most — the concentration of computer services in fewer and fewer firms.

Small companies should not be allowed to become extinct or be absorbed by larger entities, Srager argued. "Not infrequently, the best ideas come from small entities," he said.

Moreover, he added, "the thrust of our antitrust laws and other rules against monopoly and monopolization is to try to keep smaller firms alive. To simply stand by while these firms are absorbed through the lack of capital is to run counter to the basic philosophy that has guided this country almost from its beginning."

Some Mass. DP Workers Poorer As Result of Recent Snowstorm

BOSTON — Salaried employees of Massachusetts computer companies suffered few economic hardships as a result of a merciless blizzard that recently dumped as much as four feet of windblown snow in the eastern part of the state. Hourly workers, however, were not as fortunate.

When the hourly wage earners finally returned to their jobs after a four-day storm shutdown, many learned they would receive no pay for the period they had been unable to get to work. Others found their paychecks ready and waiting — but with a catch.

Salaried employees, by contrast, received no cut in earnings, even though they had missed as much work as their assembly line counterparts.

HIS Policy

Honeywell Information Systems, Inc., which typified the no work/no wages policy, paid its 4,750 salaried workers but withheld paychecks for its 1,450 hourly employees. The company explained its action by saying that in business many differences in privileges and payment practices traditionally distinguish hourly from salaried employees.

Data General Corp., took a somewhat different approach. Instead of paying its pro-

duction workers unconditionally for their missed work time, the minicomputer vendor advanced them a full paycheck and required them to make up the missed time by June 1.

If the employees earn less than the required sum, DG will deduct the remainder from their future paychecks.

Other area computer companies, however, proved more generous in their payment practices. Digital Equipment Corp., Prime Computer, Inc. and Inforex, Inc. paid both their salaried and hourly workers in full.

DEC, which has no unions, paid its 8,000 production employees \$2 million for time away from their jobs. Company officials said they felt their employees had already suffered enough from the storm without enduring the further hardship of a pay loss.

Japanese Exploring IBM Plans

TOKYO — The six major computer companies here have embarked on a joint investigation into the possible Future Series (FS) of computers expected from IBM, according to the *Japan Economic Journal*.

The group has hired a U.S. consultant through the Japan electronic Industry Development Association, the *Journal* reported.

As a followup, the group will establish a project team to glean any information available on the possible architecture for the new systems in order to develop their own new models at around the same time IBM announces FS.

It is the first time the six have banded together in a joint investigation, according to the *Journal*.

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CI Notes

Amdahl Doubles Earnings, Dividends

SUNNYVALE, Calif. — Amdahl Corp. appears to be booming along, announcing revenues and pretax earnings double those of 1976 and simultaneously doubling the dividends and announcing a two-for-one stock split.

The split is subject to approval of stockholders at the April 18 annual meeting of a move to increase the authorized number of shares from 10 million to 40 million, the firm noted.

Revenues for 1977 amounted to \$188.8 million and pretax net was \$54.2 million — representing a 103% and 126% increase, respectively, over 1976, the firm added, when revenues were \$92.8 million and income was \$24 million.

Net income, with an extraordinary credit of almost \$10 million, was \$36.6 million (\$4.48 per share) compared with \$22.7 million in 1976, the firm said.

The dividend has now been set at 10

cents per share and Dr. Gene Amdahl, board chairman, said it is the intention of the board to pay a quarterly dividend of 5 cents per share after the two-for-one stock split.

Taiwan Eyes Electronic Banking

TAIPEI, Taiwan — The Ministry of Finance here is seeking U.S. computer equipment suppliers to bid on developing an electronic banking system for the island in a contract the U.S. Department of Commerce estimates could amount to \$100 million over the next few years.

Vendors wishing more information should contact Richard K. Chi, director, Department of Monetary Affairs, Ministry of Finance, 2 Ai Kuo West Road, Taipei, Taiwan.

Supershots

A coalition of institutional investors has made a \$1 million equity investment in Printronix Inc., Irvine, Calif., according to Robert A. Kleist, president. The investment was arranged by Robertson, Colman, Siebel and Weisel.

The 1,000th Hewlett-Packard Co. HP 3000 Series II has gone to the Consumer Food Group of General Mills, Inc., where it will be used in a distributed network. It is the fifth unit purchased by this General Mills group.

Computer Network Corp. has postponed its plans to sell 400,000 shares of common because "management believes that the current market price trend of Comnet stock caused by

general market conditions is not satisfactory."

Computer Automation, Inc. has set up a division called the Small Computer Group in Richardson, Texas, to handle engineering, manufacturing and marketing in the low-end OEM minicomputer marketplace.

The Computer Dealers Association has voted to grant associate membership to computer leasing firms.

Dataproducts Corp. has signed a five-year agreement for the purchase of its Model 2470 line printers with Electronum of Romania. The initial amount of the agreement is \$3.6 million, the firm said.

Foreign Orders & Installations

Lion Fat & Oil Co. of Tokyo, manufacturer of synthetic detergents, and Amada Co. Ltd., an integrated manufacturer of metalworking machinery headquartered in Kanagawa Prefecture, Japan, have each ordered a Univac 1100/11 system valued at more than \$4 million from Nippon Univac Kaisha, Ltd.

Tahsis Co. Ltd., a British Columbia forest products company, has installed a Honeywell Model 64/20 system valued at \$600,000. It will be used for on-line weight scaling, log inventory and general-ledger functions.

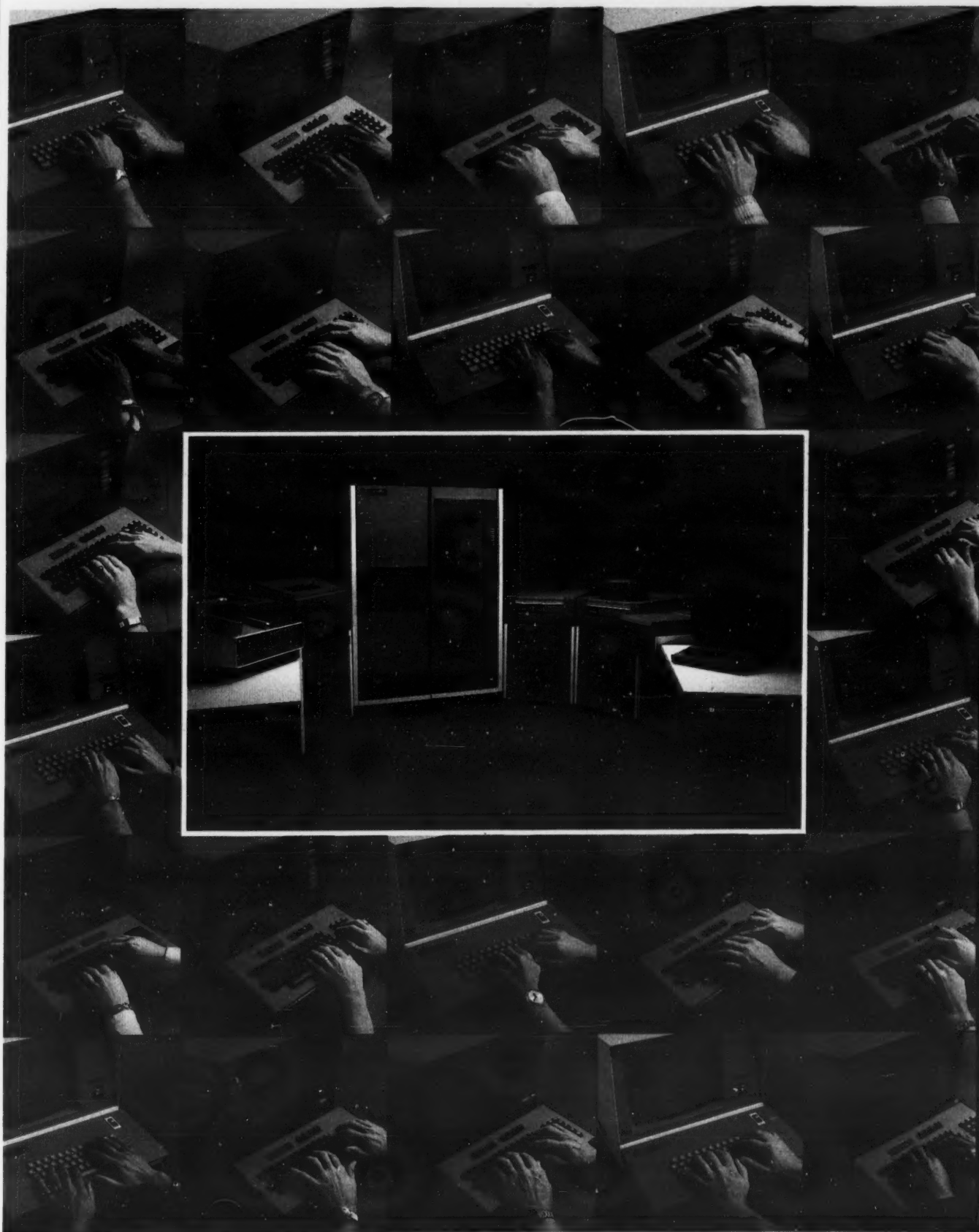
The Royal Bank of Scotland Ltd. is installing a 44-display Harris 8170 terminal network to handle customer investment, inquiry and systems development applications. The value of the purchase is approximately \$238,000.

P.C.W. Underwriting Agencies Ltd., an affiliate of the Lloyd's insurance group, has ordered an NCR 8550 system to enhance its services. The system will be installed at the company's headquarters in Farnborough, Hants, England.

Abbey National Building Society, a UK mortgage loan institution, has ordered a Univac 1100/80 computer system. The computer will be installed at the society's headquarters in London.

Unitex Ltd., a Hong Kong garment manufacturer, has installed an NCR 8250 system to help process the company's 1,800-person payroll and provide management information.

The Japanese National Mutual Insurance Federation of Agricultural Cooperatives, headquartered in Tokyo, has ordered a Univac 1100/81 computer system valued at approximately \$2.8 million from Nippon-Univac Kaisha Ltd.



After Firm Presents Case

Judge Suggests Jury Decide Memorex's Cause

By Molly Upton
CW Staff

SAN FRANCISCO — "The jury is the judge of the facts." That's what judges usually tell juries.

But Judge Samuel Conti, presiding over the Memorex vs. IBM antitrust trial, has proposed that the jury decide at the end of Memorex's case whether Memorex has shown cause to support its antitrust complaints. Normally this decision could be the province of the judge.

In a suggestion that surprised both IBM and Memorex attorneys and which Conti admitted has little precedent, the judge suggested that if the attorneys both agreed, the jury could de-

cide whether the case should continue through IBM's defense. One attorney termed the idea "novel."

Conti indicated that neither side had anything to lose: if the jury found Memorex had not shown cause, then the case simply would be cut short; if it found Memorex had made a sound antitrust case, then the trial would continue and it would go to the jury after IBM's defense, as would normally be the case in a trial in which the judge does not declare a directed verdict.

There has been considerable speculation as to whether Conti would care to become the third judge in recent times to declare a directed verdict in an anti-

trust case against IBM.

The Ninth Circuit Court of Appeals recently overruled a directed verdict in the case of Greyhound vs. IBM and ordered that case back to court for a full trial. The appeal before the same court for the same reason in the California Computer Products, Inc. vs. IBM case could be heard as soon as this spring.

If his suggestion is accepted, Conti could relieve himself of the responsibility of declaring a directed verdict for lack of evidence.

Conti told the attorneys they need not make a decision on his suggestion until the end of Memorex's case. Both parties would have to stipulate giving the authority to the jury.

Acquisitions

Graham Magnetics, Inc.'s stockholders have approved the merger of Graham Magnetics into a wholly

owned subsidiary of Carlisle Corp.

Intel Corp. has acquired United Medical Data Systems of Long Beach, Calif.

Microdata Corp. has concluded a transaction to acquire a majority interest in Computer Machinery Ltd. of Hemel Hempstead near London.

On-Line Systems, Inc. has acquired Atkins Computing Services, a UK company, and Timesharing B.V., in The Hague, from the W.S. Atkins Group.

Intel Corp. has acquired Compumet, Inc. of Hayward, Calif., a wholly owned subsidiary of Fireman's Fund Insurance Co.

Recognition Equipment, Inc. has acquired Universal Business Machines, Inc. (UBM) of Columbia, S.C.

ITT Corp. has agreed in principle to purchase Courier Terminal Systems, Inc., a subsidiary of Boothe Computer Corp., and the business and assets of Courier Terminals, a division of Canadian Boothe Corp., Ltd.

Ferranti Ltd., headquartered in England, has acquired all the common stock of Interdesign, Inc., Sunnyvale, Calif.

Xerox Corp. has acquired the assets of the manufacturing division of Arista Information Systems, Inc. of Winston-Salem, N.C.

Valtec Corp., a Massachusetts electro-optics and fiber optics manufacturer, has received approval for the acquisition of Comm/Scope Co., a private Catawba, N.C., cable making firm.

Alanthus Corp. has agreed in principle to merge with a new subsidiary of UTG, Inc. Alanthus valued the proposed merger at about \$11 million. Alanthus leases computers and communications and copying equipment. UTG, based in New York, operates oceangoing tankers.

Raytheon Co.'s principal British subsidiary, Cossor Electronics, Ltd., has acquired Data Logic Ltd., a computer software and systems firm, for approximately \$6 million.

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"Who's Winning?"

Involving Product Codes

Europeans Urged to Proceed Slowly With POS

LONDON — An industry leader in retail ordering systems has warned against the premature adoption of expensive point-of-sale (POS) systems based on the newly launched European Article Numbering (EAN) system.

Bill Patton, MSI Data Corp.'s vice-president for marketing, cautioned that despite their potential benefits, EAN-based scanning systems could prove very slow to implement. Under the system, most packaged groceries would bear the EAN product code on their containers.

"All retailers, particularly high-volume operations such as supermarkets, will be affected by the new coding system," Patton said. "The unique numbering will allow automatic capture of information on coded articles for such tasks as stock control and sales reporting.

Scanning Devices

"We can expect emphasis to be placed by equipment manufacturers on the use of cash registers with devices able to scan the bar-coded information printed on the product," he said.

Heeding the American experience with the five-year-old Universal Product Code, prospective users of EAN systems should recognize that several years will pass before packaged goods manufacturers can mark enough merchandise with the EAN code to make POS equipment viable, Patton said.

Account for Delay

UK retailers that are considering adopting EAN systems should take this deal into account. They should also realize that manufacturers will need a long leadtime to register themselves in the EAN number bank, he added.

"POS systems are not only premature, they're expensive," as the American experience with scanning systems illustrates, Patton asserted.

Randal Develops Micro Subsidiary

TORRANCE, Calif. — Randal Data Systems has announced the formation of Vista Computer Co., a wholly owned subsidiary, to serve the personal computing marketplace.

Vista intends to focus on the software and service needs of microcomputer users by manufacturing support systems and peripherals. Plans to expand an already existing service company include having a service location within 50 miles of every computer sold, according to Tom Pine, Vista president.

Makeshift Features

"Hardware prices are rapidly coming down, but the user still must cope with core images, keyed-in debuggers, low-level software and other makeshift features that make it difficult to accomplish any useful work with the equipment," Pine said.

Vista is located at 2807 Oregon Court, Torrance, Calif. 90503.

Only 173 of the approximately 200,000 food stores in the U.S. have installed computerized scanning systems thus far, according to an August 1977 report by the Food Marketing Institute.

In-store Computer Machinery

"Suitable POS terminals with scanners costing around \$5,790 per checkout need the support of an in-store computer," Patton said. "The cost of the in-store computer must be spread over the number of checkouts in the supermarket."

In the UK, where supermarkets average far fewer checkouts than their American counterparts, the cost-

checkout could total as much as \$8,685, he warned.

"At a far lower cost, retailers can quickly take advantage of the introduction of the EAN by adopting a stock replenishment system using portable data terminals," Patton explained.

Under MSI's version of this system, shelf labels, rather than the product containers themselves, would bear a product description and bar-coded EAN equivalent. When reviewing stock for replenishment, retailers would pass a wand scanner attached to an MSI terminal over the bar-coded shelf label and record the quantity required.

Then, by coupling the terminal to a telephone, the retailers would automatically transmit the information to a DP center or warehouse.

"Unlike POS, the benefits are not confined to larger multiples," Patton explained. Using the stock replenishment system, small independent retailers can enjoy 90% of the advantages of article numbering, even though they lack a computer, distribution network and warehouse.

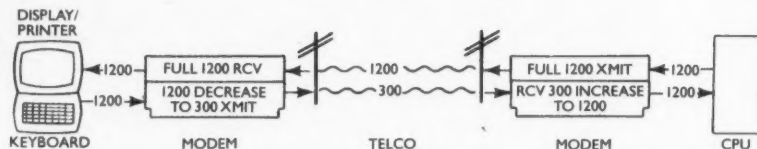
Moreover, they can achieve these benefits "for a fraction of the cost of cash registers with scanning devices," he said. "All [they] need is a simple MSI terminal costing around \$1,930 and shelf labels."

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VEN-TEL

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Consolidated Distribution Services, a public warehouse firm located in Lawrence, Mass., has installed a Honeywell Information Systems Level 62.

The city of Anderson, Ind. has ordered a 90/30 system from Univac to be used for on-line customer services, a utility billing and collection system, inventory control, payroll, a permit system and a police system.

International Creative Management, a talent agency, has ordered a Honeywell Information Systems Level 62 to monitor contracts, royalties, commissions and fees for clients. The system is valued at \$198,000.

A.W. Mathews Engineering Co. of Hibbing, Minn., has ordered a Univac 90/25 to be used for special services and for the processing of payroll and project cost control.

Orders & Installations

Ohio College Library Center has received a 10-processor system from Tandem Computers Inc. The system is valued at \$1.9 million.

The City of Tempe, Ariz., has ordered a Hewlett-Packard 3000 Series II.

Dixon Paper Co., Denver, Colo., has ordered a Univac 90/30 system to implement an on-line product information system.

Thrift Drug Co. has signed a contract with Texas Instruments, Inc. for more than 300 advanced pharmacy systems to be installed in pharmacies in 25 states.

Midwest Advanced Computer Ser-

vices, Inc. of Southfield, Mich., has ordered two Burroughs B4800 systems valued at \$2 million.

Carle Clinic, a hospital and medical clinic in Urbana, Ill., will install four Harris 8180 intelligent terminal systems with 32 CRT keyboard/display units for computerized scheduling and patient admissions applications.

Keenan Supply, Inc., a piping distributor, has ordered a Honeywell Information Systems Level 62 for use in order entry and invoicing applications. Other uses will include accounts receivable, accounts payable, sales analysis and data collection.

The Hertz Corp. has ordered a Univac 1100/82, valued at approximately \$7 million, to be used in car reservations, billing, credit card accounting and general accounting work.

Strawbridge and Clothier of Philadelphia, Pa., has ordered 640 additional TRW 2001 terminals and associated data communications equipment valued at \$3 million.

Buster Brown Textiles, Inc., a nationwide distributor of children's clothing, has installed five Series 21 distributed processing systems from Mohawk Data Sciences Corp. for use in data entry application.

Dickerson, Inc. of Monroe, N.C., a heavy-construction company, has ordered a Honeywell Information Systems Level 62 to expedite job-costing.

Florida Software Services of Altamonte Springs has added an IBM 370/138 for use in its financial computing systems program.

Western Airlines has leased a 200-line Corp. CBX with automatic call distribution for telephone reservation service.

Centax, a Dallas building contractor; A&M Direct Mail Service, Inc. of Los Angeles; and International Terminal Operations (ITO) of New York have ordered Inforex, Inc.'s System 500C for file management.

Butterick Fashions of New York City, a producer of dress patterns, has purchased an Imlac Corp. Composer-1552, a multistation composition system for use in producing multilanguage yardage blocks for both Butterick and Vogue patterns.

Princeton University has ordered 13 SEL 32/75 systems from Systems Engineering Laboratories, Inc. for use in the Tokamak Fusion Test Reactor (TFTR). The systems are valued at nearly \$2 million.

Reynolds & Reynolds, a producer of business forms and supplier of DP services based in Dayton, Ohio, has installed 10 Scan-Optics OCR System 501s.

Seattle-First National Bank of Seattle, Wash., has ordered the Incoterm Corp. Series 7000 retail banking system, which will link tellers statewide with the bank's computer in Seattle.

Peterson, Howell & Heather, Inc., a business services firm headquartered in Baltimore, Md., has installed a Harris Corp. 8770 intelligent CRT terminal system for inventory, ordering and account status applications.

The Management & Information Systems Department of the City of Houston, Texas, has ordered a Univac 1100/12, valued at more than \$3 million. The system will be used for computer-aided dispatch of patrol cars and an automated records system.

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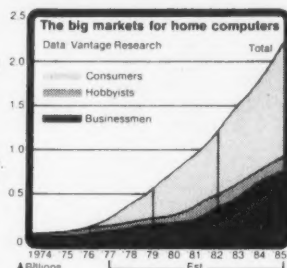
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Executive Corner

• Karl E. Gates has been elected president of Business Systems Products, Inc. Other officers reelected for 1978

include H.D. Thoreau, chairman of the board; George C. Erickson, executive vice-president; and Calvin J. Eberle and A.S. Gugliotta, vice-presidents.

• Gary H. Lohn has been named vice-president of human resource development and public affairs for Control Data Corp.

• R. LaMar Thayne has been appointed vice-president of information systems at Envirotech Corp.

• Charles F. Sheridan has been appointed vice-president responsible for the Government Systems Division and Allen F. Joseph has been appointed manager of the Commercial Systems Division at Infodata Systems, Inc.

• David L. Mitchell has been named president of Data I/O Corp. Grant C. Record will remain chairman of the board and will oversee the company's sales activities.

• Timothy P. Fitzgerald has been appointed chief executive officer for Image Systems.

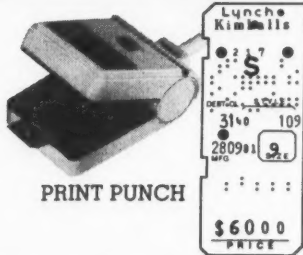
• John Music has been appointed vice-president and general manager of Docuprint, Inc.

• Jack Garrity has been named to the position of director of sales for Centronics Data Computer Corp.

• William P. Conlin was elected vice-president of product management and Robert D. Merrell was elected vice-president and group executive for the Computer Systems Group at Burroughs Corp.

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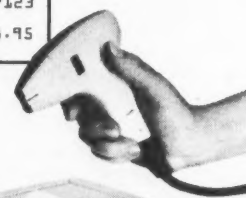


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Cray in the Black

Mainframers Post Strong Results in Earnings

Mainframe computer companies continue to show strong revenues and earnings, with Honeywell, Inc., NCR Corp. and Univac reporting sharp earnings increases and Cray Research, Inc. breaking into the black for the first time.

At Honeywell, earnings from operation of the firm's computer business increased to \$79 million in 1977 from \$41 million in 1976.

Overall, the company showed revenues of \$2.9 billion, up from \$2.5 billion, and earnings totaled \$145.1 million compared with 1976 earnings of \$101.1 million from ongoing business. The firm also showed \$2 million capital gain from the sale of Honeywell Bull.

For the fourth quarter ended Dec. 31, sales, rental and service revenues were \$832 million compared with \$738 million in the previous fourth quarter. Earnings were \$48.6 million compared with earnings of \$43.2 million.

During 1977, the company purchased in the open market 2.2 million shares of its own stock for \$105.3 million in connection with transactions related to the computer business. Of these shares, 1.4 million were exchanged for the 11.7% interest that the General Electric Co. owned in Honeywell Information Systems as a result of Honeywell's 1970 purchase of the GE computer business.

The remaining shares purchased were used in 1978 in an exchange of shares for stock of terminal maker Inco-term Corp.

Honeywell Information Systems revenues of \$1.037 billion increased 13.5% over 1976. Operating profit rose to \$79 million from \$41 million in 1976.

Worldwide computer orders "continued at a very strong pace and increased significantly over the previous 12-month period," Honeywell said. Computer rental and service revenue increased 14.6% to \$598 million in 1977. Outright sales rose 12% to \$439 million in 1977.

NCR Quarter Up 52%

At NCR, earnings in the fourth quarter rose 52% to \$59.3 million, compared with \$38.9 million in the fourth quarter of 1976.

The fourth-quarter results brought year earnings to \$143.6 million, a 50% gain over the \$95.6 million reported in 1976. On a per-share basis, 1977 earnings were \$5.09 compared with \$3.60 per share in 1976.

Worldwide revenues for 1977's final quarter totaled \$774.3 million vs. \$715.8 million in the prior year's quarter, an increase of 8%. Revenues for 1977 totaled \$2.5 billion, up 9% over 1976 revenues of \$2.3 billion.

All of the 1977 earnings and revenue figures represented records for the company on top of record 1976 figures, a spokesman noted.

Univac Revenues Grow

Univac's parent, Sperry Rand Corp., reported earnings for its third quarter ended Dec. 31 of \$39.6 million, up 8.1% over the \$36.7 million earned in the same period last year.

Third-quarter revenues totaled \$906.1 million, up 12% over the \$808.7 million reported in the year-ago

period.

Backlog was \$2.55 billion, up 22% over a year ago, an all-time high for the corporation.

Univac computer revenues rose 16% for the quarter, the firm said.

"We're very pleased with the computer business both in the U.S. and in our principal international markets," a spokesman noted. "Bookings for the quarter are again up substantially and our large-scale 1100/80 series has been especially well received."

"Our total computer backlog is up 30% over a year ago. We see continuing strength in demand and we are confident we can continue to attract new users and increase our installed

base, which should soon top \$9 billion," he added.

The sale of an \$8.8 million Cray-1 computer system, installed at the National Center for Atmospheric Re-

search, has produced the first profitable quarter and year for Cray Research.

Fourth-quarter revenues of \$9.8 million produced earnings from operations of \$3 million. Additional income

of \$1 million, equal to 68 cents per share, from tax benefit of operating loss carryforwards brought quarter earnings to \$4 million, or \$2.75 per share.

A year ago the company was in its development phase and quarterly revenues were \$508,999 with a net loss of \$555,217.

For the year ended Dec. 31, revenues were \$11.4 million, up from \$508,999 in 1976. Operating income was \$1 million. The tax-loss carryforward of \$1 million increased net income to \$2 million or \$1.41 a share.

This compared with a net loss of \$1 million for the same period a year ago.

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Honeywell	Kodak	Sykes Datatronics
Datamation	BASF	Cummins Allison
Communication News	IBM	American Microprocessor
McCormack & Dodge	Anderson Jacobson	International Data Corp.
Data Rentals	Computer Input Services	Programs, Inc.
Computer Sales International	Paradyne	Beehive International
Intel	ComData	Interlec Data Systems
Electronic Ventures	Genesis One	Software AG
Computer Roomers	Data Processing Sciences	Creative Engineering
Customer Priorities	Applied Computer Systems	Graphic Controls
Computer Software Solutions	Agile	Mini-Computer Systems
Systems Marketing	Woodford Systems	Tandem Computer
S.E.A.	American Used Computer	PCC/Perfec
Tri-Data	Business Forms Service	Computrend
Midwest Marketing	Itel Corporation	Extel
Logabax	Deltak	Mentel
AAA Chicago Computer	Peripheral Products	Sycor
Intelligent Systems	General DataComm Industries	Digitronics
Shasta	Continental Peripherals	Computer Services
Mostek	Computer Associates	Datamart
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| <input type="checkbox"/> Midwestern Computer Expo | Chicago | May 2-4 |
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In Quarter, Year

Mini Makers Reach Record Earning Levels

Not to be outdone by the mainframers, mini makers Digital Equipment Corp., Prime Computer, Inc. and Systems Engineering Laboratories, Inc. (SEL) also reported record earnings in the past month.

DEC reported sales and earnings for the second quarter and first six months ending Dec. 31. For the six months, the firm reported operating revenues of \$649.2 million compared with \$445.5 million in the prior year.

Net income for the half was \$58.9 million (\$1.43 per share) against \$39.4 million (\$1.01 per share) a year ago.

There were an average 42,327,720 common and common equivalent shares outstanding compared with an

average 38,909,863 common and common equivalent shares in the period last year.

Total operating revenues for the second quarter were \$346.6 million as compared with \$241 million in the second quarter of fiscal 1977, up 44%. Net income was \$32.5 million (77 cents per share). A year ago, the company reported second-quarter earnings of \$22.7 million (58 cents per share). Earnings per share rose 33%.

According to a company spokesman, the gain in sales and earnings came from the planned acceleration in shipments of computer systems during the first half of the current fiscal year as the company's manufacturing capacity and productivity in-

creased materially. This has resulted in the ready availability of most models from the company.

He added that ongoing spending and expense control programs and a reduction in the projected effective tax rate for fiscal 1978 were also factors in the 43% gain in quarterly earnings.

The company indicated that, as a result of continuing customer adjustment to the ready availability of DEC products, the rate of growth in orders is lower than the inordinately high levels of a year ago.

The company cautioned that while the rate of revenue growth in the first six months is indicative of very favorable sales and earnings gains in fiscal 1978, second half growth rates are expected to be lower and will be influenced directly by current demand factors in the company's markets.

Prime Computer, Inc. reported sales for the year ended Dec. 31 were \$50 million, an increase of 119% over sales of \$22.8 million for 1976. Net income for the year, before utilization of tax loss carryforward, increased 215% to \$3.8 million (\$1.41 per share) compared with \$1.2 million (\$.53 per share) in 1976.

Sales for the fourth quarter of 1977 were \$15.8 million, an increase of 97% over the \$8 million recorded in the corresponding period last year. Net income for the quarter was

\$1.4 million (49 cents per share), an increase of 214% over the \$441,000 (19 cents per share) for the same period last year.

SEL Records

The best three-month and six-month periods in the financial history of SEL were reported by the company for the second quarter and first half of fiscal 1978.

For the second quarter ended Dec. 23, SEL recorded a net profit of \$1.2 million (44 cents per share) which includes an extraordinary gain resulting from the utilization of net operating loss carryforwards of \$555,000 (19 cents per share) on revenues of \$11.6 million.

For the corresponding period a year ago, the company reported a net profit of \$314,000 or 11 cents per share, which included an extraordinary

gain resulting from the utilization of net operating loss carryforwards of \$132,000 or 5 cents per share on revenues of \$7.9 million.

For the first half, the company recorded a net operating profit of \$2.1 million (75 cents per share), which included an extraordinary gain of \$975,000 (34 cents per share) on revenues of \$21.4 million. This compares to a net profit a year earlier of \$471,000 (17 cents per share), which includes an extraordinary gain of \$263,000 (10 cents per share) on revenues of \$13.9 million.

The company also announced that the new orders rate amounted to approximately \$14 million for the second quarter and \$28 million for the first half of 1978. During the reporting period, backlog increased to a record of nearly \$37 million.

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Earnings
Reports

ANACOMP			
Three Months Ended Dec. 31			
	1977	1976	
Shr End	\$.33	a\$.27	
Revenue	5,273,116	3,284,547	
Earnings	356,771	289,426	
6 Mo Shr	.60	a .48	
Revenue	10,450,461	6,214,013	
Earnings	650,382	522,085	

a-Adjusted for 10% stock dividend in September 1977.

AT&T			
Year Ended Dec. 31			
	1977	1976	
	(000)	(000)	
Shr End	\$6.97	\$6.05	
Revenue	36,494,806	32,815,582	
Earnings	4,543,933	3,829,151	

BUNKER RAMO			
Year Ended Dec. 31			
	1977	1976	
Shr End	\$1.64	\$1.18	
Revenue	341,212,000	316,428,000	
Tax Cred	1,880,000	
Earnings	10,340,000	9,408,000	
3 Mo Shr	.45	.53	
Revenue	83,797,000	74,661,000	
Earnings	2,822,000	3,699,000	

COMDISCO			
Three Months Ended Dec. 31			
	1977	1976	
Shr End	\$.83	\$.71	
Revenue	30,156,849	38,902,948	
Earnings	890,122	727,028	

DATASCOPE			
Three Months Ended Dec. 31			
	1977	1976	
Shr End	\$.25	\$.31	
Revenue	3,143,656	2,811,942	
Earnings	277,541	355,900	
6 Mo Shr	.48	.61	
Revenue	6,193,935	5,467,980	
Earnings	540,265	696,359	

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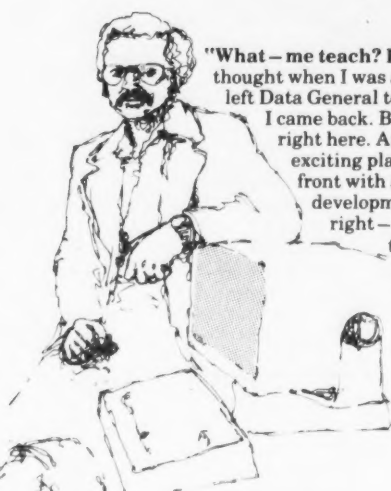
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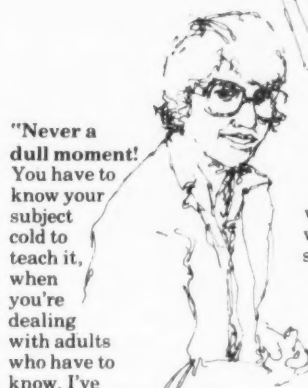
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Ken Rodrigues
Supervisor, Software Education

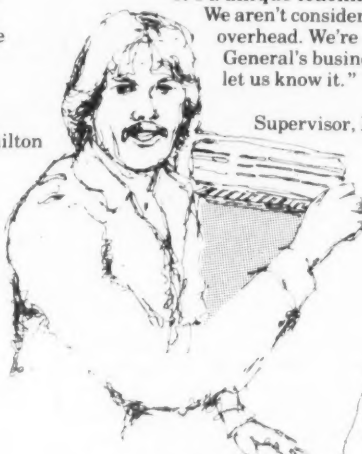


"Never a dull moment! You have to know your subject cold to teach it, when you're dealing with adults who have to know. I've always liked explaining things. As a Data General instructor I never have to worry about motivating the class. They're here because they're already motivated."

Maureen Hamilton
Sr. Educational Specialist

"I've moved up from instructor to systems training specialist. We develop objectives, lesson plans and our own course materials. Then we see to it that everything works. There's a lot of responsibility and plenty of reward. You know, if you have a new idea we'll give you all the time and space you need to develop it. I call that real growth opportunity."

Sandy Kimball
Systems Training Specialist



"It's a unique teaching situation. We aren't considered part of the overhead. We're vital to Data General's business and they let us know it."

Ron Berman
Supervisor, Hardware Training



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Mike Renzi
Manager, Marketing Training

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With 2 or more years' real time systems or applications programming experience (assembler and higher level languages) on mini-to-medium computers, you're on your way. Knowledge of operating systems and communications, previous teaching experience desirable. You will develop and conduct programming/software courses for customers. And there is the opportunity to keep your hand in applications programming.

Hardware Instructors

You need 2 or more years in field service engineering or design. You should have peripheral device experience as well, and minicomputer and teaching experience will help. You will develop and conduct hardware familiarization and maintenance courses for our customers' engineering and service personnel.

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You will participate in the design, development, and implementation of our Sales Training courses. Programs are offered for both newly hired and experienced sales representatives. They include a variety of technical and selling skills topics. You need more than 2 years' technical background (computer programming, systems design, engineering) and direct sales experience (computer systems, peripherals, software) in an OEM or end user environment.

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Member of a design team responsible for specification, design, and testing of MOS microprocessors and microprocessor peripheral devices. Will be responsible for MOS system, logic and circuit design, planning and supervision of chip layout, development of test programs, device testing, and characterization. Requires BS/MSEE and 1 year circuit or logic design. MOS experience desirable.

MOS Microprocessor Systems Engineers

Responsible for the specification, design and programming of microprocessor-based systems from

concept through production. Requires BS/MSEE and 1 year experience in assembly level programming, logic hardware, and minicomputer and/or microprocessor software.

Product Engineers

Work with a team of process engineers, device and system designers, and production personnel to implement new products into production and into the market. Quickly assume responsibility for test generation, yield improvement, cost reduction, and device characterization of MOS LSI devices. Requires BSEE or physics and 2 years' applicable experience. Requires knowledge of LSI fabrication and testing.

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Handle all product marketing responsibilities for geographic area for MOS memory or microprocessor products. Provide customer presentations, proposals, spec evaluations,

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Analyze market opportunities. Participate in product definition for MOS microprocessor products. Prepare product documentation, pricing and merchandising for specific markets. Requires BSEE or CS and 3-5 years' applicable experience.

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The University is located in Muncie, IN, a city of 80,000 people, approximately 50 miles northeast of Indianapolis. Starting salary range is \$21,100-\$27,500.

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Dr. Richard C. McKee
Assistant to the President

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University of Arizona

Tucson, Arizona

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Candidates should have both technical knowledge and successful management experience. A doctorate is desirable but not required. Salary will depend on qualifications and experience. Applications close April 15, 1978. Send vita to Dr. Jean Weber, Chairman of the Search Committee, c/o Office of the Dean of the Graduate College, 501 Administration Building, The University of Arizona, Tucson, Arizona 85721.

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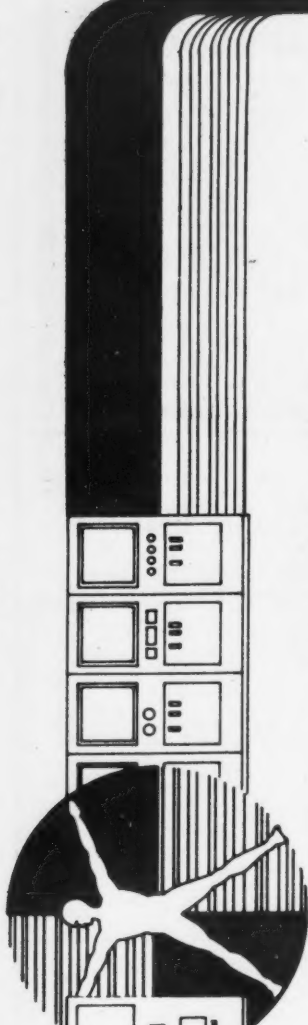
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Working in health administration and claims processing, you'll be involved in support systems design for health care; on-site customer support at management levels; and interface with OSI's technical staff. Required is a degree in Computer Science or equivalent experience, including 3 years' in programming and 3 years' as an analyst, with heavy COBOL and IBM 360/370 experience. Health care experience is desirable.

Programmer/Analysts

Several opportunities are available here involving many diverse activities, some of which include designing and coding structured COBOL programs, walk-throughs, testing and systems analysis, and other duties related to health care/claims processing. We have openings for the following experience levels:

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- B.A. or B.S. degree, plus 3-5 years' data processing experience, including COBOL (ANS), IBM/OS, utilities, CFMS, CICS.

Project Managers

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This position involves the implementation of a large CICS MVS installation with over 600 CRT terminals and a massive data base. Preferred is a B.A. or B.S. in math, engineering, or science, plus 5 years' in a systems software OS VS environment. Heavy experience in CICS communications, SOFTWARE AND VSAM a must.

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You'll develop and implement an optimum work flow system and assist in staffing all levels of personnel for health care clients. You must be familiar with work flow systems and procedures and man-motion studies. An Industrial Engineering degree is required and a background in health insurance claims processing/ clerical functions preferred.

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You'll supervise our technical staff in San Francisco, and will provide technical support to marketing, including proposal preparation, cost estimates, feasibility studies and demos. Requires college degree, with emphasis on computer science or business administration, with at least 3 years' large scale IBM experience using OS (MVT, VS or MVS) in a programmer/analyst position.

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SENIOR SYSTEMS ANALYST

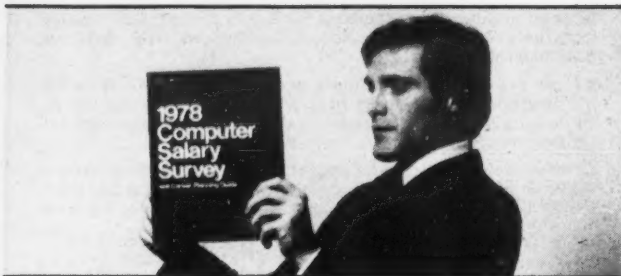
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- Three to five years experience
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- Technical proficiency including a working knowledge of Cobol and exposure to assembler. Knowledge of communications systems and data base management a plus.

Programmer Analysts

- Some Design experience preferably in manufacturing systems
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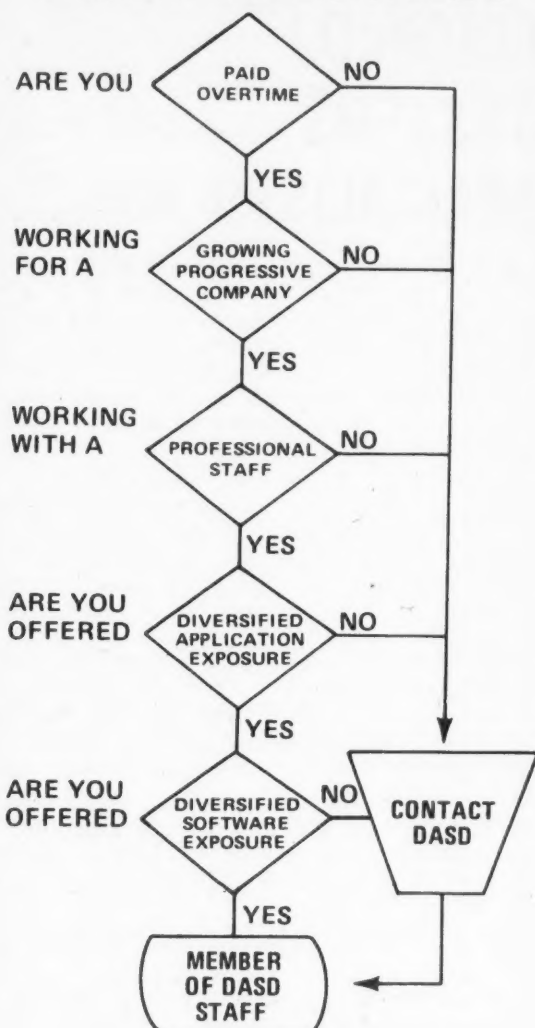
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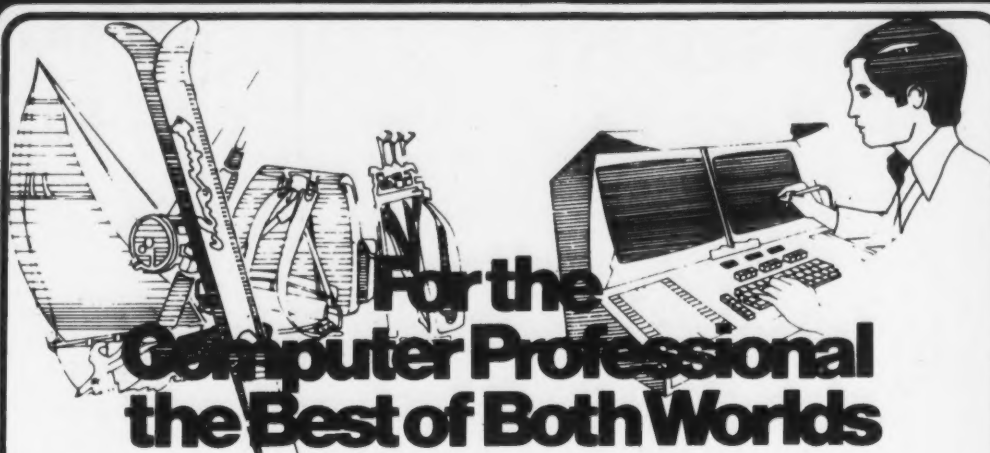
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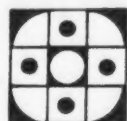
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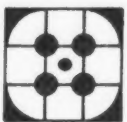
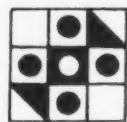
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A DATA BASE ADMINISTRATOR IS ACTIVELY BEING SOUGHT BY OUR CLIENT. THIS SENIOR PROFESSIONAL WILL BE RESPONSIBLE FOR THE EVALUATION, DESIGN & IMPLEMENTATION OF DATA BASE MANAGEMENT SYSTEMS. EXPERIENCE SHOULD INCLUDE DATA DICTIONARY DEFINITION AND PSBGENS. KNOWLEDGE OF LARGE SCALE IBM SYSTEM 370 ENVIRONMENTS HELPFUL. EXPOSURE TO SUPERVISION AND USER INTERFACE A PLUS. ALL INTERVIEW AND RELOCATION EXPENSES WILL BE PAID. STARTING SALARY MAY REACH UP TO \$29,000. PLEASE CALL: 415/781-5260.



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Please send your resume to: Albert Fillion, Research & Development, COMSHARE, INC., PO Box 1588, Ann Arbor, Mich. 48106.

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Design and program system software modifications and extensions, System Installation, Testing, System Performance Measurement.

Position entails hands-on access to four Control Data Cyber 70 Computers in a state-of-the-art scientific and engineering environment.

Minimum B.S. degree in Math, Computer Science, or Engineering (Systems or Electrical Engineering). Fortran IV and assembly language programming. Good understanding of computer hardware and operating system architectural concepts.

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If you're interested, send your resume including salary history, training and experience to Byron Mayo, President, Jennings & Thompson/FCB, 3003 North Central Avenue, Phoenix, Arizona 85012. All replies confidential. And we're an equal opportunity employer.

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We need an unusually competent problem solver who can adapt quickly to a variety of computer environments and applications, overcome obstacles and deliver under pressure. Your ability to design software, lead less experienced programmers, and write quality code is more important than your experience in a particular environment. Knowledge of an assembly language and COBOL is required; other languages (BASIC, PL/I, FORTRAN, DIBOL) are highly desirable. Pay negotiable. San Francisco area. Write:

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Systems Software

Immediate Openings

Sargent & Lundy, a leading design engineering consultant to the power industry, has immediate openings in our Systems Support, Performance and Control Group for computer professionals. Our installation includes a UNIVAC 1100 18J operating under EXEC-8.

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Degreed Senior Software Systems Programmer with thorough capability of programming, testing, modifying, measuring and evaluating the System. Must be able to direct other Systems Programmers and possess superior written and verbal communicative skills. Several years of experience is mandatory; UNIVAC desired.

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Degreed, with approximately 3 years experience on a UNIVAC system, preferably in the EXEC-8 software systems generation and maintenance functions. Responsibilities will include the programming of complex software additions or modifications to the operating system, language processors and utilities. Strong communicative skills are mandatory. Operational experience and UNIVAC exposure would be helpful.

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Degree preferred (others considered) and a minimum of 1-2 years experience in Fortran, coding and debugging. Duties include providing help to in-house users for problems with runstream preparation, language syntax, software and remote terminals. Some teaching experience and UNIVAC exposure helpful.

We offer an excellent starting salary, modern working conditions in the newly-constructed Mid-Continental Plaza, full fringe benefits including tuition reimbursement and a professional working atmosphere with a long-term career opportunity.

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The Office of Management Information and Computing is seeking an Analyst/Programmer with two to four years of college and coursework in math or business related field. Applicants must have three to six years experience in systems analysis and programming, two of which must be in systems analysis; COBOL and IBM/DOS required. Applicants with experience in higher education applications, on-line systems or DBMS preferred. We offer an excellent benefits package. Salary is in mid-teens. Send resume and three professional references by March 13, 1978 to University of Vermont, Personnel Office, Box 57D, Waterman Building, Burlington, Vermont 05401.

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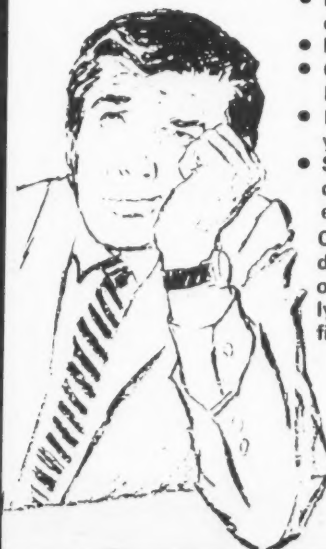
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San Diego opportunity in EDP SYSTEMS DEVELOPMENT

Want to combine the ideal career opportunity with your favorite lifestyle? NCR Special Systems Division needs your help now in developing advanced, high-technology, EDP systems for customers around the world. You'll be doing important work in our Sorrento Valley facility, just three miles from the ocean and only minutes from Torrey Pines, La Jolla and downtown San Diego. You can live in the setting of your choice — beach, valley, mountain, country, small-town or urban — and still be only a short drive from work. Spend your leisure hours golfing, swimming, hiking, getting advanced degrees from major universities, attending theatrical, music, art and sports events, or soaking up the year-round sun. Pick your climate, too — from mild coast to dry desert. San Diego is a place of extraordinary choices — and right now the choice is yours.

COMPUTER PROGRAMMERS

The Special Systems Division has opportunities for software professionals in a broad range of disciplines and in all experience levels. Our current and firm future programs require top people with experience in any of the following areas:

- Telecommunications Software
- File Processing
- Network Development
- Large Mainframe, Mini and Micro Processor
- Operating Systems
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- Assembly Language

Assignments will include the development and implementation of various EDP systems for specific customers as well as the development of future NCR total systems; both requiring state-of-the-art knowledge.

Our benefit package is what you would expect from a major blue chip corporation. What you might not expect is the relaxed and very creative environment of this small, highly specialized division. The facilities are modern, comfortable, designed to provide an atmosphere in which every employee can achieve an uncommon degree of personal and professional satisfaction. May I offer you the opportunity to judge for yourself? Please send your resume (with salary history) to me.

NCR

Thom Harris, Employment Specialist
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A college degree or equivalent experience is required. A broad background in IBM 360/370 computer systems is required in addition to the ability to write and deliver presentations to clients. It is desirable that you have a knowledge of the following systems:

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We offer an excellent salary and benefits package and an environment in which a talented individual may excel. For immediate and confidential consideration, send your resume to Allen Hunt, Storage Technology Corporation, 2270 South 88th Street, Louisville, Co. 80027. We are an equal opportunity employer.

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You will assist in maintaining Gould software running on IBM, UNIVAC, CDC, and DEC equipment. Close liaison with customers required to define and solve applications problems. You will also be called on to help the marketing department with pre-sale software installations.

Applicants should have experience in generation and maintenance of IBM operating systems, and be capable of resolving system and application problems. Assembly language and Fortran experience on large IBM system highly desirable. Position requires a degree in computer science, or equivalent experience.

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DATA PROCESSING PERSONNEL

EG&G Idaho, Inc.,
the prime operating contractor
to the Department of Energy at
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Candidates should have a college degree or equivalent, and a minimum of 1 year experience in the development and implementation of business and management information systems along with proven capability in ANS COBOL. Experience with MARK IV and/or DBMS and knowledge of JCL for OS/MVT is desirable.

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Will perform feasibility and systems design, procurement justification and evaluation of automatic data processing equipment. Also involves performance monitoring and analysis for improving present computer systems, a CDC CYBER 70/Model 76, and CYBER 170/Model 173 computer systems. BS or equivalent in Electrical Engineering, Computer Science or related field, with 8-10 years of applicable experience.

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data processing

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You will work on large complex systems providing new program development and enhancing existing programs. Application includes areas such as: Data Base Management Systems, Financial & Accounting Systems, Energy Systems, Manpower Systems, Insurance, and General Business.

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- Fire Control Systems
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- Real-Time Communications Systems

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If you have one or more years experience in any of the above areas, we would like to hear from you. We prefer a degree in computer science, EE, math or equivalent experience. While a background with Univac Military or commercial computers is a plus, equivalent computer experience, particularly with 16 bit computers is also desired.

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John DePrima (703) 558-4486
Or Rush Resume to:

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Technical Services Division
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Municipal Computer Center desires individual with a minimum of 3 years solid COBOL programming and JCL experience with knowledge of several of the following:

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Responsibilities include writing, testing, debugging, documentation, and implementation of new programs and program modifications.

Starting Annual Salary for this Mass. Civil Service Position has been established at \$15,030 with excellent benefits and projected salary increases.

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Manage a real-time on-line system with dual 360's (DOS) and a network of minis.

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Min. 2 yrs. exp. in BAL with IBM 360.

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... From Programmer Analysts to Sr. Systems Analysts

We need a variety of aggressive, innovative talent... results oriented self-starters who want to achieve in an open, receptive environment. Our record of growth and expansion has been... and continues to be... impressive. Keeping pace with this surge demands expansion in the MIS area. An effort by far-thinking, creative individuals who won't accept anything short of accomplishment.

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As a member of our highly visible EDP staff, you can expect top professional and personal rewards. Advancement potential is controlled by your ability. Salary and benefit programs are among the best in the industry. If you rate yourself among the best in your field... get everything you deserve... at Miller. To arrange an interview, submit your resume with salary history to: Mr. Udo Schroff, Dept. 124-8 Corporate Recruiting, Miller Brewing Company, 4000 West State Street, Milwaukee WI 53208.

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We offer opportunities to participate in the design and development of on-line transaction processing software. You would also be involved with software interfaces to data base management systems. Candidates would be working with a software development team engaged in transaction processing software development for the NCR Criterion processors utilizing VRX.

To qualify for these outstanding positions, candidates would have a technical or computer science degree. One or more years experience in software development projects is required. A thorough knowledge of operating systems, assembler language programming, and real-time concepts are among the qualifications you would possess.

PROGRAMMERS (Assembler Language)

We are seeking programmers with a technical or computer science degree plus one or more years programming our manufacturing divisions and for sale to our customers the system will address the following application areas:

MANUFACTURING SYSTEMS ANALYSTS

NCR is now involved in the development of an integrated, on-line Manufacturing Control System for use both in our manufacturing divisions and for sale to our customers. The system will address the following application areas:

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This development effort has created opportunities in the following area:

SYSTEMS ANALYST/PROGRAMMERS

Major emphasis will be to prepare the system application software and documentation for external release for use on NCR's new Criterion computer line. To qualify the candidates' background should include one or more years systems and programming experience using COBOL in one or more of the above application areas. Ideally that experience will also include the use of data base and on-line processing.

The ideal candidates will have a bachelor's degree in an appropriate discipline.

To investigate these outstanding opportunities, write to:

NCR
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Department VM
Corporate Executive &
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COMMUNICATIONS TECHNICIANS

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Minimum of four or five years experience required in the following areas:

- Programming Mux's and using TPLX gear in cascaded fashion.
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Must be familiar with Timeplex Equipment, line characteristics & nationwide network. Managerial experience a must. COMTEN background helpful. Send resume with salary requirements to: (Principals only)

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We are one of the West Coast's leading electronics manufacturing firms with exciting, challenging projects for Analyst Programmers in our Data Processing Department.

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Send resume or rough note of objectives, salary, location restrictions, education and experience (including computers, modals, operating systems, and languages). Our client companies pay all of our fees.

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Our technical environment will also give you exposure to CICS, IDMS, PANVALET, METACOBOL, and ROSCOE.

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Cutler-Williams, Inc. wants you if you have the following...

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Computer Sciences Corporation, with over 8,500 computer professionals, knows how to develop and reward computer expertise.

CSC's System Sciences Division is meeting new project demands in support of our Space Tracking Data Network Project at the NASA Goddard Space Flight Center, located in suburban Washington, D.C. If you want to share our future in Space and feel you fit the requirements listed below, please investigate immediately...

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Positions require a degree in Computer Science, Math, Physics, or Engineering with programming experience on any hardware configuration. Opportunities include design and development of real-time and non real-time telemetry communications systems, satellite command and communications systems, operating systems, distributive network systems AND design and development of hardware diagnostics for communications, operator, and data storage devices.

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Will participate in a wide range of activities from hardware installation, modifications, and diagnostic testing to analysis and resolution of software/hardware related anomalies. These technical support services are required on mini and medium size mainframes, disc and drum storage units, CRT terminals, magnetic tape units, data transmission units, stored program decommutators, timing systems and other peripheral devices. We require a BSEE or technical/military school training (as applicable to the position) and 3-6 years related experience.

CSC offers an excellent benefits package including a liberal relocation policy and competitive salaries. For immediate consideration, please send resume or call:

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Located in west suburban Chicago, the Cooperative Computer Center serves the administrative data processing needs of three Board of Governors Institutions: Chicago State University, Governors State University, and Northeastern Illinois University. Resources include a staff of 60, production software developed by SCT Corp. and an ITEL AS/4 computer supporting several RJE stations in an OS/VS1 environment.

Reporting to a council of the three university presidents, chaired by the governing board's Executive Director, the Executive Director is responsible for optimizing the performance of present resources, developing long-range ADP plans, preparing operating budgets, recruiting staff, allocating resources, project management, and ensuring that the universities receive timely and accurate management information. Minimum academic qualification is a bachelors degree; a masters degree in Computer Science or a related field is preferred. In addition, candidates should possess significant technical and administrative experience related to the management of an administrative computer center. Such experience should include a successful record of planning, budgeting, policy development, coordination and technical leadership for cost-effective university information systems. Candidates must be able to establish effective working relationships both with senior executives and technical personnel, and be sensitive to the varying information needs and political considerations within a university cooperative.

Starting annual salary will be \$33,000 to \$37,000, depending upon experience.

Resume, references and salary history must be received by March 31, 1978 and should be addressed to: Dr. Donald E. Walters, Chairman, CCC Director Search Committee, Board of Governors of State Colleges and Universities, 544 Iles Park Place, Springfield, Ill. 62718. An Equal Opportunity/Affirmative Action Employer.

HONGKONG POLYTECHNIC



The Hong Kong Polytechnic is an expanding institution which is now putting into effect a forward looking development plan relevant to the needs of Hong Kong.

Applications are invited for posts at Principal Lecturer, Senior Lecturer and Lecturer levels in Computing Science. Areas of interest to the Polytechnic include Commercial Systems Analysis and Design, Data Processing, Programming, Systems Programming, Management Information Systems, Computer Education in Schools, Computer Assisted Instruction, Computer Graphics, Microcomputers and Computer Applications in areas relevant to the Polytechnic including Engineering, Mathematics, Design, Accountancy, Business Studies and Textiles. Indication of aptitude, experience and interest in one or more of these areas would be appreciated.

Successful applicants will be required to teach on one or more of the following courses:

- (a) 3-year Higher Diploma in Systems Analysis
- (b) 1-year Certificate in Computer Programming
- (c) 2-year Diploma in Computing Studies
- (d) 2-year Higher Diploma in Computing Studies
- (e) service courses to other Departments in the Polytechnic
- (f) short courses during the day or evening relating to various computer applications

Salary Scales

Principal Lecturer: HK\$91,740 to HK\$113,340 p.a.
Senior Lecturer: HK\$74,460 to HK\$100,380 p.a.
Lecturer: HK\$40,920 to HK\$73,980 p.a.
(Note: on 23.1.1978 HK \$4.62 = US\$1
(Starting salaries will be commensurate with qualifications and experience)

Conditions of Service

Appointment will be on a two-year gratuity-bearing contract terms initially. Thereafter suitable appointees may be offered further contracts or super-annuable terms of service at the discretion of the Polytechnic. Other fringe benefits include:

- 25% gratuity on salary
- Free passage
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- Education allowances
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- Generous leave
- Subsidized accommodation
- School passages

Application forms and further information are obtainable from the General Secretary, Hong Kong Polytechnic, Hung Hom, Kowloon, Hong Kong. Completed application forms should be returned direct to the General Secretary, Hong Kong Polytechnic, Hung Hom, Kowloon, Hong Kong by March 20, 1978.

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NEW OPPORTUNITIES IN DATA PROCESSING

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3-5 years experience

SR. PROGRAMMER

3-4 years experience

PROGRAMMER

0-2 years experience

REQUIREMENTS

Degree

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IBM 370 OS/JCL

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Tektronix, Inc. develops, manufactures and markets internationally recognized precision electronic measurement instruments, computer peripherals and related electronic instrumentation. Located near Portland, Oregon we are within a two hour drive of the Cascade Mountains and Ocean Beaches. The close-by natural playgrounds and the City of Portland provide a variety of recreational and cultural interests.

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Send detailed resume and salary history to Larry Green, TEKTRONIX, INC., P.O. Box 500, C86, Beaverton, Oregon 97077.

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We are seeking a sophisticated Engineering Manager to head-up our rapidly expanding engineering department. Required is an engineering degree and 10-15 years of experience, at least 5 in Management, with communications hardware design and development. Knowledge must include microprocessor based hardware, software applications and manufacturing interface capability for product delivery.

This position reports to the Vice President of Marketing and is responsible for the Product Engineering, Applications Engineering and Software Engineering groups. The current engineering budget exceeding One Million Dollars is planned to more than double in 1980. Our Company is a National supplier of Data Communications Terminals with headquarters located in the East.

Compensation is salary and bonus plus an excellent benefit package.

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Position requires minimum 1 year of applications experience utilizing CICS/VS, DOS/VS and ANS COBOL required. IBM 370/138 equipment. Experience in a manufacturing environment with System 3 or 32 experience especially desirable.

You will be earning a salary commensurate with your experience and education, benefits including profit sharing and relocation, and enjoying the excellent potential for both professional and personal growth we can offer now.

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Apply now and match your career plans with our growth opportunities.

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- 2+ years experience using Cobol under CICS in DOS/VS environment.
- Ability to use creative talents to see a project through completion.
- Desire to work on all aspects of state-of-the-art projects in a professional environment.
- Need to advance within a growth oriented firm.

If you are the type of person we seek, please submit your resume to:

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Salary is commensurate with experience.

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The successful candidate will have a computer science or engineering degree plus 2-4 years' experience in the software design, programming and testing process control systems using minicomputer systems like DEC or Data General.

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Responsibilities will include consulting, user education, documentation, programming and benchmarking new hardware and software. The successful candidate will have 3+ years experience and considerable expertise in Control Data computers, including competence with FORTRAN and BASIC (COBOL and/or APL a plus), a thorough knowledge of CDC control language, utilities, and familiarity with COMPASS, system internals, and/or data-base applications.

Located at our Windsor, Connecticut Data Center, this position offers an excellent starting salary and a full range of benefits. For prompt, confidential consideration, forward your resume, including salary history, to: H.R. KAIN, COMBUSTION ENGINEERING, 100 Lamberton Road, Windsor, Connecticut 06095

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Large urban trial court with independent DOS/VS, CICS/VS 370/145 installation with distributed processing seeks aggressive, dynamic individual to plan, coordinate, and supervise its computer system. The individual will be responsible for expanding on-line applications into the juvenile and civil areas and planning for the development of a fully integrated court information system. Implementation of a data base management system throughout the court is planned.

The successful candidate, must have demonstrated management competence and technical ability and should have a minimum of a bachelors degree and 5 years of D.P. experience in progressively more responsible positions. Individual must have a proven ability to manage timely and successful completion of DP projects, must be able to develop short and long range DP plans, and provide internal training programs for DP staff and users. It is imperative that the individual selected be able to communicate successfully with court executives and other DP users as well as with DP personnel. It is desirable that applicants have experience in the use of data processing in the justice environment and DP management experience is preferred.

The job offers a salary in the range of \$36,171 through \$47,025 and excellent government benefits.

Respond by March 10, 1979 to director of personnel, D.C. Superior Court, 613 G St. N.W., Rm. 505, Washington, D.C. 20001. Providing a detailed summary of experience and references.

PROGRAMMER

OR

PROGRAMMER/ANALYST

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COBOL and REAL time experience helpful, but not essential.

If you want to work in a challenging environment and are looking for a professional growth position, then you should consider us.

Excellent starting salary with many company paid benefits.

Please send your resume, in complete confidence, including experience and salary requirements to:

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Newton, MA 02160

Come to Coastal S. Carolina Manufacturing PROGRAMMER/ANALYST

The Robert Bosch Corporation, an international pioneer in manufacturing diesel fuel injection products, has an immediate opening for a Programmer/Analyst.

The successful candidate should have a B.S. degree or equivalent with 3-5 years manufacturing systems experience in the following areas: Cost Accounting; Inventory Control; Requirements planning; shop flow control, and capacity planning.

Knowledge of DOS/VS, COBOL, ALC, and DBOMP a must.

Duties will be in the design and installation of various manufacturing systems.

You will be living in a warm coastal city and working in a modern sophisticated setting that offers excellent technical development opportunities.

We offer excellent wages and a fringe benefit package that includes Life insurance; short aid long term disability, hospital, medical and dental insurance, 10 paid holidays, paid vacation and sick leave, educational assistance, company paid retirement plan, credit union and relocation expenses.

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The Information Systems Department in one of Upstate New York's largest medical centers is currently expanding. We offer outstanding opportunities for Computer Programmers and Systems Analysts with 1 to 6 years experience in a medical center and/or large progressive computer installation. Assignments will include involvement in Online Data Base Applications in a 370 DOS/VS environment using CICS and DL/I. Salary commensurate with experience. Outstanding fringe benefit package. Send resume with complete salary history and requirements in confidence to:

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PROGRAMMER: NCR

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Consulting is acknowledged to be one of the two fastest growing segments of the computer industry and the traditional insititions are not keeping pace with demand.

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Exclusively Employer Retained Agency

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CSC's Commercial Division

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Duties and responsibilities involve all phases of EDP work, the design and implementation of new systems, the maintenance, improvement and modification of existing system and tailoring and implementation of packaged systems to our requirements.

We offer an excellent salary and benefit package, as well as growth opportunities for the candidates who meet our requirements.

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Immediate Career Opportunities

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Senior Systems Analyst — 3 to 5 years functioning as a systems analyst with experience including DOS/power/VS, ANS COBOL, DATA COMMUNICATIONS/DATA BASE (CICS); Requirements definition and systems design of financial and merchandising applications.

Programmer Analyst — 2 years functioning as a programmer writing program specs and designing COBOL programs. Specific experience should include DOS/POWER/VS, ANS COBOL, CICS and developing programs for financial, merchandising and inventory control applications.

Competitive starting salaries, excellent benefits program and opportunities for career growth.

Call now or send resume to:

MORRISON INCORPORATED



Human Resources Department
First National Bank Building
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Mobile, Alabama 36625
205/432-9711 Extension 263

MULTICS SYSTEM SPECIALISTS

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SYSTEMS ANALYST/PROGRAMMERS

Will be primarily responsible for providing the initial user support and user interface for Honeywell's Control Systems users as they interface with the MULTICS/LEVEL 6 system operated by CNO. Duties will involve implementation and support of specific communications and networking services for the system. College degree or equivalent training, with 2-5 years experience as a programmer/analyst required. Telecommunications and minicomputer software/hardware experience necessary. Honeywell Series 16 and Level 6 experience strongly desired.

COMPUTER APPLICATIONS ENGINEERS

Responsibilities will include the development of strategies and long range plans for the implementation of a Corporate distributed processing computer network. Requires the ability to work from generally defined project descriptions and the fitting of user computer applications to specific configurations.

College degree or equivalent computer training, plus 3-5 years host and minicomputer experience necessary. Experience in planning the use and integration of minicomputers into an integrated, multi-computer network required. Familiarity with operating system architecture and project leadership involving planning, analysis, and execution necessary.

PLEASE SEND RESUME, INCLUDING SALARY HISTORY, IN COMPLETE CONFIDENCE OR CALL (612) 870-2802.

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The Computer Resources Group
Agency, Inc.
303 Sacramento Street
San Francisco, California 94111

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CFA Associates Personnel, Inc.
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Washington, D.C. 20036

Programmer

with sound Electrical Engineering background. Applicant must have usable working knowledge of: ALGOL, SPL, COBOL, and BASIC; Stack Architecture Computers; System Science; Computer Science, preferably degreed or skills and experience comparable. Duties: Interfacing phototypesetting equipment to H-P 3000 creating comprehensive typesetting system. \$10,400 per yr. Free Parking. Send resume to Job Service, 505 Washington, St. Louis, Mo. 63101, Attn: Maxine Whelean.

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The position will involve you in computer programs for state and local governments, as well as FM marketing support. You'll have considerable customer interface, and will write up proposals to support their marketing needs. Up to 35% of your time will be spent on travel. Your qualifications should include a computer-related degree, excellent writing skills, and a broad data processing background encompassing at least 8 years.

Our offer includes a salary of \$30,000+, depending on your experience and abilities, plus a generous benefits package. For immediate and confidential consideration, please send your resume and salary history to:

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The Corporate Engineering Group of this Fortune 500 leader in commercial printing has career opportunities for degreed Engineers or Computer Scientists involving the implementation of mini computer based systems over a broad range of applications.

These positions require comprehensive skills including the specification, design, programming and implementation of engineering/manufacturing systems. Typical systems involve either process control or manufacturing logistics.

2 years experience with Fortran systems are required. Work with PDP-11 RSX operating systems a plus. If you meet the requirements for this position and seek a challenging career opportunity, please send your resume and salary history in confidence to:

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Recruiting Coordinator

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Generous compensation package will include salary, bonus, stock options, full benefits, and paid relocation for the right person. Both a lucrative potential income level and realistic advancement opportunity are within your grasp, due to this company's exceptional track record and its remarkable profitability.

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Our Information Systems Department has an opening for a Technical Analyst/Programmer which would involve identifying and evaluating data processing needs for machine utilization, software, data base and other technical programming requirements. Knowledge of DBOMP and one other data base system is required.

We also need an Analyst/Programmer with strong experience in applications such as production control, purchasing, receiving and market analysis.

We operate on an IBM 370-148 Computer in a DOS environment and use Cobol and Assembly languages.

Qualified candidates should have a degree in computer science, math or other related subjects.

Qualified candidates should send a resume of experience and salary history to the address below. Information may also be obtained by calling (413) 785-5381, ext. 266.

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Challenging position involves development and operation of innovative TP system for Government Ministries. Will manage international staff of DP and Micrographics professionals with interaction at the highest levels of government. Must have at least 10 years solid DP experience and at least 5 years in significant management positions. Experience with large scale IBM TP systems required.

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Position involves implementation and maintenance of an innovative IBM 370 TP system with CRT and Microfiche terminals. At least two years in-depth experience maintaining IBM OS TP systems required, preferably CICS with 3270 terminals. Must be able to maintain system single-handedly.

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Minimum of five years experience in analysis and design of business TP applications. Must be knowledgeable in COBOL and IBM OS TP systems, preferably CICS and 3270 terminals. Should be capable of leading large projects.

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Minimum five years experience in applications design and programming in a TP environment on IBM 370 OS systems. Must be fluent in COBOL and assembler and possess knowledge of IBM's CICS and 3270 terminals.

Salaries commensurate with experience. Excellent benefits. Six weeks paid vacation annually with round-trip air fares to place of residence. Free furnished housing and free education for children. Send resume and salary history to:

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- On line, real time processing
- Data Base applications or design (IDMS, S2000, EDMS, IMS, or other similar system)
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IPS Computer Marketing Corp. is a major dealer and lessor of used IBM computer equipment. We are looking for an experienced leasing salesman for our office in Fort Lee, New Jersey. Will have responsibility for leases in present portfolio, lease brokerage, and leasing of new IBM processors. At least five years successful sales experience required, with minimum of two years in leasing field. Prefer someone now living in New York City area. High earnings potential through commissions. Please send resume (no telephone calls) to G.H. Heilborn, President.



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University Computing Center seeking programmer and analyst/programmer. Must have good technical skills and be able to communicate that effectively with faculty, staff, and students in an academic community. Prefer degree in computer science or statistics with:

- two years experience in design and programming of time sharing system or applications, and experience with TSO; or
- two years experience in design and programming of job accounting or financial management applications.

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Successful applicants will be given ample opportunity to develop and implement their creative skills and assume decision-making responsibilities.

Salary is open to the right individual.

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Systems Research Laboratories, Inc., is a highly diversified technological company. Our Computer Systems Group needs six Real-time Mini-computer Programmer/Analysts for Process Control, real-time data acquisition and graphics applications. SRL was founded in 1955, expanding at the rate of 17% per year, on target for 100 million in business by 1986. If you are interested in professional growth, challenging assignments and excellent career opportunities on the East Coast or Mid-west, call me or send me a resume today: A.J. Davis, Technical Recruiter c/o SYSTEMS RESEARCH LABORATORIES, INC., 2800 Indian Ripple Road, Dayton, Ohio 45440. (513) 426-6000. Equal Opportunity Employer. M/F/H.

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This is a solid opportunity to be the key force in systems development for an expanding company. Requirements include: BS degree minimum; proven management ability; experience in a 370 OS MVS environment utilizing PL-1 and COBOL; and communications skills ensuring effective liaison with users through upper management. Attractive compensation package plus excellent benefits.

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We have an immediate position available for a Programmer to do problem analysis, preparation of diagrams, flow charts, writing machine instructions and procedures for computer operators, as well as to document programs.

Our successful candidate should have a working knowledge of PL/1 or Assembly Languages plus 1-2 years experience in business applications on an IBM-370-DOS/VS, CICS configuration.

We offer an excellent salary and outstanding benefits including cash profit sharing, life, health and dental insurance, in addition to relocation assistance to beautiful, smog-free Santa Barbara.

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Rapidly growing Denver firm is looking for a Sr. Software Specialist with several years experience in OS/VS internals, BAL, BTAM and VTAM. Position involves technical leadership and development of complex software. Excellent salary and benefits with opportunity for advancement into management. Interested applicants may send their resume, including salary requirements, to:

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Multiple positions exist in Atlanta and the sunbelt states for IBM experienced programmers. Salaries \$21,000 - \$33,000.

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for
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Faculty Position

Individual sought to teach systems analysis/systems design classes in software-oriented computer science program at Sangamon State University, Springfield, Illinois, an upper level, two year and graduate institution offering bachelor's and master's degrees. Rank and salary negotiable. Background in systems analysis, data base design, data communications, and performance evaluation desired. Ph.D. in computer, information, or management science preferred, master's degree considered. Business and/or government experience desirable. Located in state capital, Sangamon State has an HP3000 computer, six Plato terminals and has full access to a CDC Cyber 72 and a large-scale IBM computer. Send resume by March 15 to Prof. Phillip Koltun, Sangamon State University, Springfield, IL 62708. An affirmative action/equal opportunity employer.

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Due to an expansion in our Systems and Data Processing activities, an opportunity exists in our 222-bed general hospital in Wisconsin's Fox River Valley. The successful applicant will have the ability to plan, organize and control all Data Processing Department functions. Hospital experience is preferred with knowledge of NCR computer systems desired. Submit your resume and salary requirements to:

Robert Christ
Director, Systems & Data Processing
Appleton Memorial Hospital
1818 N. Meade Street
Appleton, WI 54911
(414) 731-4101

Sacramento Peak National Observatory is seeking a Chief Programmer/Supervisor. As chief programmer, the successful applicant would be responsible for the design, implementation, and maintenance of software at the Observatory's data reduction and real-time data acquisition facilities. As supervisor, he or she would manage an operation with several machines and two employees and participate in facility planning. Present equipment consists of a Sigma 5, Sigma 3 and a PDP 11/10. Applicants should have a master's degree in computer science or a related field. A minimum of four years experience in system programming, scientific fortran, and real-time software are required. Additional experience and a bachelor's degree may be substituted for the master's requirement. This position demands an advanced knowledge of programming and a good knowledge of computer design, digital electronics, and astronomical instrumentation, as well as the ability to interact with scientists and direct subordinate personnel. Send resume including salary history to:

Frank Hegwer
Sacramento Peak Observatory
Sunspot, New Mexico 88349
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SENIOR EDUCATION ANALYST

This newly created position offers a challenging opportunity with a NYSE listed hospital company.

Position requires BS in Computer Science/Business plus 2 to 3 years experience teaching System Education Documentation.

Responsibilities include developing, directing and teaching System Education; will also involve working with Task Forces and User Groups in System Education Programs.

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Design and implementation of Software to control physical processes and produce related output data and reports. Must have programming experience in a manufacturing environment with Fortran, PDP-11 hardware and RSX-11M Operating Systems. Experience with IBM-370 software will be considered a plus. Degree in Science, Math or Engineering Field. Applications include automated inspection, production and laboratory equipment.

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These positions will be of particular interest to people who regard themselves as well above the average in technical competence and who are interested in playing a major role in the design decisions for a new management information system.

Please write us if you would like to explore this opportunity. We would appreciate a resume and, in addition, a letter describing your abilities, experience, and professional interests. Please address your reply to:



Director of Systems Development
General Instrument Corporation
11126 McCormick Road
Hunt Valley, Maryland 21031

DATA PROCESSING**SYSTEM PROGRAMMER**
VM/370

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Our Data Processing Department is undergoing a phenomenal growth period. We need qualified COBOL programmers to continue our success story. Our salary and benefits are better than the market, our IBM hardware and software is still "tomorrow" at most places. Besides all that, by joining us now, you would be in an ideal position to take advantage of the growth still to come. To get in on the action, all it takes is one year's COBOL programming.

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*An Equal Opportunity Employer M/F***SYSTEMS****PROGRAMMER**

The University of Iowa Computer Center is seeking an exceptional person with systems programming experience on CDC NOS or KRONOS operating systems. The qualified applicant will have three to five years' experience and a strong background in CP and PP COMPASS. Responsibilities will include systems maintenance and participation in challenging software development projects. We offer competitive salary, exceptional benefits, and the special advantages of living and working in a University environment.

Send resume and salary history in confidence to Wayne L. Robinson, 112 LCM, The University of Iowa, Iowa City, IA 52242.

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PROGRAMMER

Analyze Specifications, design program logic, code in COBOL in batch and CICS/VS, document programs, other project record requirements. Position available immediately. Salary \$15,000+. Write or Call: Jack Weiss, Director, Renner Learning Resources Center, Elgin Community College, 1700 Spartan Dr., Elgin, IL 60120. Phone — (312) 697-1000, ext. 258. An equal opportunity/affirmative action employer.

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Forward your resume to: Ms. Ruth M. Jensen, Compek Research, Inc., 455 Cayuga Rd., Buffalo, NY 14225. An Equal Opportunity Employer.

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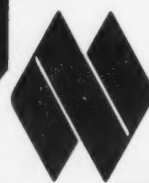
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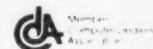
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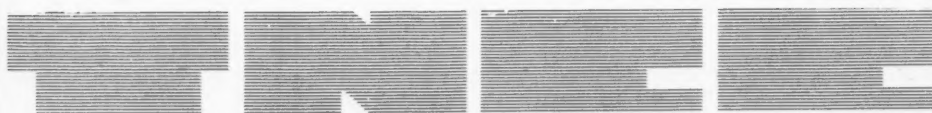
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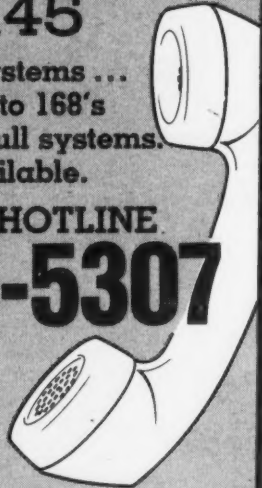
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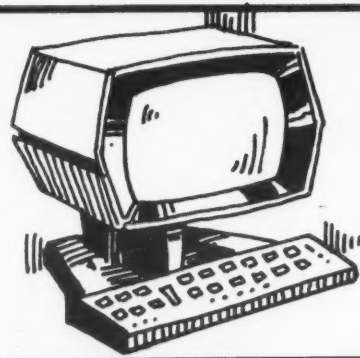
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